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## ORIGINAL ARTICLES.

### ON BRANCHIAL CYSTS OF THE NECK.

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The differential diagnosis and operative treatment of tumors of the neck, are subjects which belong to the most imperfect and unsatisfactory topics in surgery. The great difficulties which are often encountered in the diagnosis of cervical tumors, and the importance of the anatomical structures which are involved in all operative procedures for their removal, are well known and appreciated by all who can speak from personal experience. One of the most important, and, at the same time, one of the darkest chapters treating of tumors in this region, relates to cystic tumors, and more particularly that variety which originates from congenital defects of development, the matrix being composed of fœtal epiblastic or hypoblastic tissue, which remains in its embryonal state for an indefinite time, and later, by proliferation of its epithelial elements, gives rise to a distinct and characteristic type of cystic tumors. These tumors have been variously designated as branchial cysts (Roser), dermoid cysts of the sheath of the internal jugular vein (Langenbeck), deep-seated atheromatous tumors (Schede), tumors of the branchial clefts (Virchow), hydrocele colli congenita (Mannoir), hygroma colli (Luschka), atheromatous cysts of lymphatic glands (Luecke), in accordance with the nature of the contents of the tumor, or the peculiar etiological views entertained by different authors. It appears to me, however, that "branchial cysts" is the most appropriate term, as it expresses at once both the location and the character of the tumor.

#### EMBRYOLOGICAL AND ANATOMICAL REMARKS.

Toward the end of the first month of fœtal life, we see under the frontal process, open in front and bounded on the sides by four plates, the pharyngeal cavity. The upper pair of plates constitute the first branchial arch. The next three pairs of plates make up the second, third, and fourth branchial arches, which decrease in size from above downward, so that their median interspaces in front are narrow above and wider lower down. Between each pair of branchial arches on each side remains a transverse cleft, the branchial clefts, which unite during early fœtal life, with the exception of the first one, from which the external auditory canal, the cavity of the tympanum (middle ear) and the Eustachian tube are developed. The neck is thus built up of continuous lateral walls. From the second branchial arch are developed the styloid process, the stylo-hyoid ligament, the lesser cornua of the hyoid bone; the third arch forms the large horns and the body of this bone; the fourth arch assists in forming the soft tissues of the neck. The larynx, trachea, and adjacent glands are developed from other centres of fœtal growth. The primary origin of these tumors necessarily must correspond to the location of one of these branchial clefts, and clinical experience has demonstrated that they are most frequently found in the region of the second and third branchial clefts, in the vicinity of the larynx, pharynx, and in intimate relation with the sheath of the large vessels of the neck, in contradistinction to dermoid cysts about the orbits and in the scalp, which are more superficially located (Langenbeck). In the case of a young lady, Langenbeck observed a cyst situated on the left side of the epiglottis and pharynx, which occupied one-half of the floor of the mouth, and which projected from underneath the chin on that side in the shape of a smooth tumor of the size of a fist. Respiration, deglutition, and motion of the tongue were greatly impeded. The cyst contained eight ounces of atheromatous matter. The same author states that he has frequently found these tumors attached to the greater horn of the hyoid bone or to the thyro-hyoid ligaments, localities which plainly indicate that they originated from remnants of former branchial clefts.

We shall have frequent occasion to allude to the intimate connection of these tumors with the sheath of the large vessels of the neck, consequently it is very important to study their anatomical relations to these important structures. The jugular vein is surrounded throughout its whole course in the neck by a distinct and separate sheath of areolar tissue, which, on the outer side of the artery, penetrates into the deep tissues of the neck, thus completely separating the two vessels. The jugular, enclosed in its sheath, may be easily drawn over the artery toward the median line without producing any change of location of the artery. The vein being in front of the artery, and covering half of the lumen of the latter, it can be readily understood that when the vein is drawn forward with its sheath, it can be injured while the artery is not exposed to the same danger. Branchial cysts of the second and third clefts are always ob-

served in the sheath of the large cervical vessels, usually in the carotid triangle above the omo-hyoid muscle. They appear to occur more frequently on the left side of the neck. Their shape is invariably round or oval, with a smooth surface. The contents of these cysts being either fluid or semi-fluid, fluctuation can be felt, more particularly if the tumor is palpated between two fingers from the pharynx or the floor of the mouth and the external surface. Only lateral motion of the tumor is possible, on account of its peculiar attachments to the deep tissues of the neck. If the tumor is only of moderate size, the pulsations of the carotid artery can be felt on its inner margin. If it is large, it overlaps the artery, when the pulsations of the vessel are communicated to the tumor. Smaller tumors can be made to pulsate, by bending the head backward and in a direction opposite to the tumor.

### HISTORICAL NOTES.

Nearly forty years ago Roser of Marburg made the statement that many of the so-called ranulas about the base of the tongue, the mucoid and dermoid cysts of the upper cervical region, are due to imperfect closure of one of the branchial tracts. All of these tumors he included in one group under the name of branchial cysts. He described three distinct conditions which may result from entire absence or imperfect obliteration of any one of the branchial clefts.

1. Branchial fistula in case the entire tract remains patent.

2. Cystic fistula in case only one extremity of the cleft is obliterated while the other communicates with the pharynx or the cutaneous surface.

3. Branchial cysts in the event the tract is closed at both ends while between them it remains open, and by proliferation from the inner surface produces an accumulation—the contents of the cyst.

Although these tumors are by no means common, a sufficient number of well authenticated cases have been placed on record which remove all doubt as to the etiological relations which exist between imperfectly obliterated branchial clefts, the serous, dermoid, and the so-called deep-seated atheromatous tumors, of congenital origin and located in the regions formed by the branchial clefts. These tumors have since been made a special object of study by B. von Langenbeck, Luecke, Gurlt, Virchow, Schede, Esmarch and Heusinger.

### CLASSIFICATION OF BRANCHIAL CYSTS.

Branchial cysts should be classified according to their contents. The cyst walls being lined with epithelium, the only histological element in the contents are epithelia. In most instances the epithelia lining the cysts belong to the tesselated variety, but Rehn discovered in a blind congenital fistula ending near the mucous membrane of the pharynx, ciliateed pithelium; and Neumann found cylindrical and pavement epithelium in two cystic tumors of the neck, one of which was congenital, while the other was developed in later years. The presence of ciliated epithelium may be explained by assuming its origin to have been in the upper part of the cleft, the fornix pharyngis, where these fistulæ oftentimes end, and where ciliated epithelium normally exists. The lower end was probably lined with flat epithelium.[1] The physical and chemical properties of the cyst contents will depend largely on the amount and degree of retrograde transformation of the epithelial proliferation. In making the character of the cyst contents a basis for classification it is, however, important to remember that like in ordinary retention cysts, the contents of a branchial cyst are liable to undergo changes depending on the retrograde changes of the epithelial product, hæmorrhage and other transudations into the sac, or the occurrence of inflammation in the cyst wall itself. It is only during the earliest stage that the specific secretion is found in its purity. In the course of time the original character of the contents of the cyst may be completely lost by retrograde metamorphosis, or the addition of new material. Clinical experience and pathological examinations have shown that these tumors, according to the physical properties of their contents, may be divided into the following four principal varieties:

1. Mucous cysts; 2. Atheromatous cysts; 3. Serous cysts; 4. Hæmato-cysts.

Variable as the contents of these different varieties may be, more uniformity is observed in the structure of the cyst wall. In the primary stage of the affection it consists of a connective tissue capsule with an epithelial lining on its inner surface, and a delicate layer of a loosely connected reticulum of connective tissue (pericystium) which is very vascular and covers the outer surface of the cyst. A high degree of intracystic pressure may cause atrophy of the epithelial lining and thinning of the walls of the sac and, on the other hand, inflammatory proliferation produces great thickening of the cyst walls. While dermoid cysts contain the characteristic secretions of the skin and its appendages, the branchial cysts only contain the products of the epithelial cells because their walls do not contain any hair follicles, sebaceous or sweat glands, as the branchial clefts close before these appendages are formed.

1. *Mucous branchial cysts.* As a primary formation this form of branchial cyst is usually found in the upper branchial clefts. Their origin is attributable to an imperfect closure of the upper portion of the branchial tract, consequently the cyst wall may derive its lining from the mucous membrane of the pharynx, and the retention of the physiological secretion produces a mucous cyst. Many of the so-called ranular cysts about the base of the tongue belong to this variety of tumors. Among the six types of branchial cysts mentioned by Roser, the third variety consists of a cystic formation which extends from under the tongue towards the neck; the sac assumes an hour-glass shape, the constricted portion connecting the cervical with the lingual portion of the cyst. By making alternate pressure over the cyst, the contents may be squeezed from one portion of the cyst into the other. Congenital mucous cysts in the region of the base of the tongue and sides of the larynx in the majority of cases are due to an imperfect closure of the upper portion of one of the branchial tracts.

[1] Kœnig, Lehrbuch der spec. Chirurgie. Berlin, 1878. Vol. i, p. 454

2. *Atheromatous branchial cysts.* This form of branchial cysts has been described by some authors as deep-seated atheromatous cysts of the neck (Schede), and dermoid cysts of the sheath of the large vessels of the neck (Langenbeck). They are usually located in the second and third branchial tracts in the region of the hyoid bone, and intimately connected with the sheath of the large cervical vessels. These cysts contain an atheromatous material resembling the contents of an ordinary retention cyst of the skin, with this difference, however, that they never contain anything which would indicate the presence of hair follicles, as lanuginose hair or sebaceous material, or any of the more complicated products of dermoid cysts. Schede[1] has made a careful microscopical examination of the sac of a deep-seated atheromatous branchial cyst. The specimen was hardened in Müller's fluid. The inner surface of the sac was lined with layers of tesselated epithelium. The deeper layers were composed of oval or spindle-shaped cells with delicate filiform processes which were arranged in a perpendicular direction to the walls of the cyst. The nuclei were either longitudinal and granular or round, completely filling the centres of the cells. If any attempts were made to tear the epithelia from their points of attachment it was observed that the different layers were arranged in such manner as to appear dovetailed. The superficial layers showed large polygonal cells with distinct nuclei. The portion of the capsule next to the epithelia, consisted of thick concentric layers of thin fibrillated areolar tissue. Occasionally the fibrils were wanting, their space being occupied by a pale homogeneous mass of a granular substance. Outside of this structure the capsule was composed of strong bundles of connective tissue which were arranged in concentric layers, but forming a distinct reticulum. The blood-vessels in the walls of the sac were scanty, small in size, with exceedingly thin walls penetrating as far as the epithelial lining. No trace could be found of hair follicles, sudoriparous, or sebaceous glands.

For the purpose of furnishing a clear clinical picture of this form of branchial cysts I will give a synopsis of a few typical cases.

Langenbeck's case.[2] The patient was a female 17 years of age. Suffered from enlargement of cervical glands during her 12th year. Two years before the operation a soft swelling was noticed in the region of the left carotid triangle, which soon increased to the size of a hen's egg. A year later the whole neck, but especially the left side, was swollen, and the tonsils at the same time were considerably enlarged. Pains in the neck, and frequent attacks of angina had preceded these symptoms. The usual medicinal treatment in such cases and a visit to Kreuznach improved her general health, but the tumor increased in size, became more prominent, and showed distinct signs of fluctuation. At the time of operation, two years after its appearance, the tumor was oval in shape, and extended from the angle of the jaw downwards to a line on a level with the cricoid cartilage. Externally it was not very prominent, but on further examination it was evident that its base was firmly attached to the sheath of the large cervical vessels. The tumor could be felt through the walls of the pharynx, where fluctuation was distinctly felt. The anterior margin of the sterno-cleido-mastoid was somewhat elevated by the outer portion of the tumor, which received a distinct impulse from the underlying artery. The pulsations were felt most distinctly when the head and neck were turned toward the opposite side and in a backward direction. The tumor was punctured and a mass of yellowish semi-solid substance escaped, the solid portions of which were composed of epithelial cells and cholesterine crystals. The puncture was kept open by a linen tent. Later injections were made into the interior of the cyst of tr. iodinii, and when this produced no effect a concentrated solution of nitrate of silver was tried with no better result. The wound was kept open for a long time, but in spite of all efforts the cavity showed no tendency to close. A year later a seton was passed through the tumor, but without success, for as soon as it was removed the openings closed, and the cyst increased to its former size, causing pain and pressure, necessitating an incision which gave exit to a large quantity of fœtid pus. For four months the wound was kept open and iodine injections were again resorted to, but with no better effect than before. Nearly three years from the time the cyst was first noticed it was removed by extirpation. An incision was made along the anterior border of the sterno-cleido-mastoid, extending from the angle of the jaw towards the cricoid cartilage. In consequence of the long-continued inflammation, the cicatricial adhesions between the cyst walls and the surrounding tissues were found very firm, and could only be separated by a tedious and difficult dissection. When an attempt was made to isolate the tumor from the deep structures it was found to be intimately connected with the sheath of the internal jugular vein, so that, on making traction, the vein was elevated from its bed while the artery remained *in situ*. The base of the tumor and the vein appeared to form one coherent mass. The tumor was carefully drawn forward, the sheath of the vein opened and the attachments separated with the handle of the scalpel. The cyst extended upwards close to the jugular foramen and was attached to the styloid process. When the tumor was removed, the parotid gland, the styloid process, the submaxillary gland, and the right wall of the pharynx became visible in the wound. The internal jugular vein, deprived of its sheath, was seen completely isolated throughout the whole length of the wound. The carotid artery enclosed in its sheath lay also exposed in the wound. Hæmorrhage was moderate. Adhesive strips and lint compress constituted the dressing. The patient recovered without any untoward symptoms.

*Langenbeck's case.*[1] This was again a female, 20 years of age, otherwise in robust health, who consulted von Langenbeck in May, 1855. When nine years of age a tumor appeared on the left side of the

[1] Ueber die tiefen Atherome des Halses. *Archiv f. Klin. Chir.*, vol. xiv, p. 1.

[2] Beiträge zur chir. Pathologie d. Venen. *Archiv f. Klin. Chir.*, vol. i. page 1.

[1] Op. cit., p. 25.

neck, which rapidly increased in size. One year later Dieffenbach made an attempt to extirpate it, but when he discovered that it was adherent to the deep tissues of the neck he desisted from any further attempts to remove it, and contented himself with making an incision into the sac and emptying its contents, which had the appearance of a thin gruel. The cyst refilled and was again reopened by means of the actual cautery, the contents being of the same character as before. The wound was kept open for a number of years, and the cyst discharged continually. Finally the opening closed, and the tumor disappeared almost completely until, in 1854, it again increased in size, and when first seen by Langenbeck, it was as large as a pigeon's egg. It occupied the left side of the neck on a line with the upper border of the thyroid cartilage, and between it and the inner border of the sterno-cleido-mastoid. It was firm, but imparted to the touch an indistinct sense of fluctuation. The cicatrices resulting from previous operative procedures had produced firm adhesions between the sac and the skin. With some difficulty the tumor could be separated from the artery. Its location rendered it probable that it was connected with the sheath of the cervical vessels. As the tumor increased and became more painful, it was extirpated May 10, 1855. The unyielding cicatricial tissue was included in the incision and removed, the fascia of the neck was divided and the inner border of the sterno-cleido-mastoid exposed. It was found extremely difficult to sever the adhesions around the cyst walls, and the sac was ruptured on the inner surface during one of these attempts. The collapsed sac was seized with sharp hooks and drawn over toward the median line of the neck, and while the sterno-mastoid muscle was pushed in an opposite direction the dissection was continued carefully toward the base of the tumor. A broad pedicle connected the cyst with the large cervical vessels. With the index finger the carotid artery was pushed backwards and outwards with a view to keep the jugular vein, which was on the outer side of the artery, at a safe distance. As the pedicle was being divided with the scissors a sudden gush of dark venous blood welled up from the bottom of the wound, which in a moment completely flooded the neck and the operating table. The operator immediately made digital compression above and below the wound, while an assistant made direct compression with a sponge. The hæmorrhage soon ceased and the sponge was carefully removed. A careful inspection of the floor of the wound showed that the jugular vein was completely out of sight, covered by the muscular tissues of the neck, and as the hæmorrhage had ceased, it was not deemed advisable to resort to any severer measures for the purpose of guarding against another attack of hæmorrhage. After removing all coagula the wound was filled with lint, its margins were drawn together with strips of adhesive plaster, over which a compress was applied. An icebag was placed over the seat of operation. The wound healed kindly and the patient made a complete recovery. An examination of the cyst revealed that a piece of the anterior wall of the internal jugular vein, four lines in length, and two and one half lines in width, was attached to its under surface. Professor A. Luecke, then Langenbeck's assistant, in a paper on "Atheromatous Cysts of the Lymphatic Glands,"[1] makes the following comments on Langenbeck's first case: The attempt to remove the tumor by puncture and subsequent injections of iodine had failed, hence extirpation was resorted to. Traces of the former operative procedures may still be seen in the tumor, and its peculiar structure renders evident why simple puncture and injection proved unavailing. The external appearance of the tumor presents a greater similarity to an hypertrophied lymphatic gland than to an atheromatous or dermoid cyst. It has the same oval shape, and the different processes of areolar tissue that I have observed in cases of lymphatic sarcomata. It is surrounded by a thin capsule of areolar tissue and before removal gave evidence of distinct fluctuation. To differentiate between a tumor of this kind and a suppurating hypertrophied lymphatic gland is, even after removal, extremely difficult if not impossible. Errors in diagnosis are therefore not only possible but often unavoidable, but fortunately they are of no great consequence in respect to the treatment. When an incision in the tumor was made a purulent fluid was discharged, which under the microscope presented the characteristic atheromatous matter.

Gurlt[2] mentions the great similarity existing between the contents of these tumors and those of ovarian cysts. We see in our case under the microscope, fat-cells, large masses of epithelia either without or with multiple nuclei. Many cells are filled with free molecular fat, others contain fat-cells, and occasionally large nuclei are seen. We also observe the well-known crystals of cholesterin and small prismatic crystals which seem to be some form of inorganic salt, also lime in granular form. He quotes F. Hoppe, who has made a careful chemical examination of the contents of an atheromatous cyst, and has found the following to represent its chemical composition: 1.3953 grammes of atheromatous material contained the following: 0.2225 alcoholic extractive matter, 0.1235 ethereal extractive matter, 0.2005 aqueous extractive matter, 0.8555 insoluble matter. In these different ingredients he found leucin, tyrosin, cholesterin, myelin, palmitin, and stearin. Usually these cysts constitute spherical cavities surrounded by a thin smooth membrane, rarely with thickened walls or wart-like elevations, or fan-shaped protuberances, but in this instance we see cavities of greater or less size embedded in a dense parenchyma of a reddish white color which constitutes the bulk of the tumor. The cavities are distinctly separated from each other, and are not in contact with the external capsule of areolar tissue. Wart-like vegetations cover the cyst wall and protrude from it. Sections through the parenchyma show small spaces separated by areolar tissue and filled with granular matter. The contents of these follicles are lymph corpuscles and amyloid granules. These latter were soluble in glycerine, but remained unaffected by acids and alkalies.

In opposition to the views advanced by Luecke, it

[1] Ueber Atheromcysten der Lymphdrüsen. *Archiv f. Klin. Chir.* vol. 1, p. 356.

[2] Die Cystengeschwülste des Halses. Berlin, 1855, p. 268.

may be stated that the consecutive attacks of inflammation and suppuration so modified the contents and altered the structure of the cyst walls that the primary structures of the tumor was lost. The cyst wall by chronic inflammation became thickened, and the tissue proliferation of the adjacent structures may have invaded the interior of the sac and thus rendered an anatomical diagnosis exceedingly difficult or impossible. The location of the tumors, the clinical history, as well as the age of the patients, render it more than probable that both of Langenbeck's cases were atheromatous branchial cysts.

Schede calls these cysts deep-seated atheromatous cysts of the neck, without reference to their origin from imperfectly closed branchial clefts. I will describe in brief the three cases that came under his observation at Volkmann's clinic.

*Volkmann's case reported by Schede.*[1] The first case was that of a young man 17 years of age, who had always enjoyed perfect health. Two years before the operation the patient noticed a small smooth and round tumor which began to develop on the side and upper portion of the neck close to the anterior margin of the sterno-cleido-mastoid. It was painless, somewhat movable, and soon increased in size so as to give rise to deformity, and difficulty in deglutition. In February, 1870, it had reached the size of a goose-egg, presenting a smooth surface and a round or oval contour. The tumor was punctured at this time with a trocar, when about 30 grms. of a cream-like fluid was removed. The puncture was followed by an injection of tr. iodinii which was again withdrawn after remaining for a few minutes. The microscope showed an abundance of large flat cells in the fluid removed. In a month later the tumor had returned to its former size. A longitudinal incision was now made over the tumor and the cyst extirpated. The adhesions were not firm, and the operation was completed without meeting with any difficulties. The tumor was situated upon the sheath of the large cervical vessels, but was easily separated from them. Posteriorly it extended to a point between the pharynx and trachea. The wound healed promptly and the patient recovered completely.

*Volkmann's second case reported by Schede.*[2] This was also a young man 15 years of age, who, 18 months previously, noticed a small tumor on the anterior margin and about the middle of the sterno-cleido-mastoid. It increased slowly in size and resisted all ordinary attempts at treatment. When he came under Volkmann's care it had attained the size of a hen's egg. It was painless, oval in shape, with a smooth surface, and presented evidences of fluctuation. The extirpation of the tumor was again done and presented no difficulties whatever, as the attachments were not firm and could be easily separated. Posteriorly it reached as far as the cervical vertebræ, which could be plainly felt after the removal of the cyst. The walls of the sac were very thin and a microscopic examination of the contents revealed the presence of epithelial cells in a state of fatty degeneration.

[1]Ueber die tiefen Atherome des Halses. *Archiv f. Klin. Chir.*, vol. xiv, p. 1.
[2]Op. cit. p. 3.

*Volkmann's third case reported by Schede.*[1] This case was a female, 22 years of age, who, when 11 years old, noticed a small tumor in the left upper cervical region. Irritating applications had induced inflammation, suppuration, and a spontaneous evacuation of a thin sanious pus, whereupon the tumor disappeared. In her 17th year the tumor reappeared in the same place which, in spite of all treatment, increased in size, encroaching somewhat upon the cavity of the mouth. At the time the operation was performed it extended from the mastoid process to the angle of the jaw, being about 2½ inches in length and 1½ inches in breadth. The tumor was painless and movable, moderately tense, and through the mouth fluctuation could be detected. The cyst was removed through an incision parallel with the lower margin of the jaw. The adhesions in front and on the sides of the tumor were slight, but the attachments to the styloid process were firm, and were severed with the finger. The sac was opened and contents evacuated to facilitate the detachment of the cyst from the deep structures beneath; this was done with curved scissors. The tumor was not adherent to the sheath of the large cervical vessels in this case. Like in the preceding cases, the contents were composed largely of epithelial cells. Recovery was prompt and permanent.

The cases reported by Schede furnish an instructive and practical illustration of the fact that the firm adhesions to the sheath of the deep cervical vessels which were observed in Langenbeck's cases are the direct result of prolonged irritation and inflammation in the walls of the sac and the adjacent tissues, and that the removal of these tumors can be accomplished with comparative ease provided such inflammation has not preceded the operation.

*Virchow's case.*[2] Under the name of auricular teratoma of the neck, Virchow describes a branchial cyst in the person of a seamstress 24 years of age. It was first noticed when the patient was in her 14th year, when it was as large as a filbert. It increased slowly in size, and when first seen by Virchow it had attained the size of a goose-egg. It was located between the angle of the jaw and the mastoid process, and was firmly attached to the sheath of the carotid artery. The cyst was filled with a creamy yellowish fluid which contained free fat and epithelia. The walls were studded with sebaceous follicles, especially on the side toward the carotid artery. The portion attached to the sheath of the vessels contained a plate of cartilage which resembled the cartilage of the ear, hence he designated the tumor as an *auricular* teratoma. Virchow attributed the origin of this and analogous growths, to an imperfect obliteration of one of the branchial clefts. In his classification he includes the cysts which are developed from branchial clefts among the teratoid tumors.

Three cases of atheromatous branchial cysts have come under my own observation.

CASE I. Mrs. H., æt. 36, German. Family history reveals no tendency to congenital malformations.

[1]Op. cit. p. 3.
[2]Virchow u. Hirsch's Jahresbericht, 1866, vol. ii, p. 418.

General health excellent. About a year ago the patient discovered a small tumor on the right side of the neck between the angle of the jaw and the larynx, which slowly increased in size, and after a few months became the seat of an acute inflammation which terminated in suppuration, requiring an incision for the relief of urgent symptoms. The fluid which escaped consisted of pus mixed with a gruelly substance. Prompt relief followed the incision. The inflammatory symptoms subsided and the tumor diminished in size. In a few weeks the opening closed, leaving a small and painless swelling. The same symptoms were repeated about four months subsequently. When the patient came under my observation during the summer of 1883, I found a tumor about the size of a hen's egg located between the angle of the jaw and the larynx, resting directly upon large vessels of the neck, as was evident from the distinct pulsations which it received and which could be seen and felt. The posterior portion was under the sterno-cleido-mastoid. Over its centre was seen the scar which had resulted from the previous incisions. The swelling presented a regular smooth surface and an oval outline with the long diameter parallel to the cervical vessels. (Fig. 1.)

Fig. 1.

It was only slightly movable from side to side and perfectly immovable from above downward, showing that it had a firm point of attachment to the deep tissues of the neck. Fluctuation could be detected on the outer surface and also through the mouth. The original location corresponded to the third branchial cleft. As it had on two different occasions undergone acute inflammatory changes without any benefit resulting from them, the extirpation of the cyst was deemed the only measure which promised a permanent result. The operation was done under antiseptic precautions. A straight incision was made over the tumor parallel to the sterno-cleido-mastoid. The cyst was found firmly adherent to the surrounding tissue as the result of the antecedent inflammatory infiltrations and required much time and patience in its separation. After isolating it from all attachments on its sides, it was seized with a tenaculum forceps and drawn forward and toward the median line of the neck, while the sterno-cleido-mastoid was held in an opposite direction so as to afford easy access to its base. The attachments here were very firm, and it appeared as though the base of the tumor and the large cervical vessels underneath were imbedded in a mass of cicatricial tissue. Keeping as close to the cyst wall as possible, the dissection was continued very carefully, proceeding mostly with blunt instruments. When nearly one-half of the pedicle was separated in this manner, we were suddenly surprised by a tremendous gush of dark venous blood, which in a second flooded the whole field of operation. It was only too evident that the internal jugular vein had been torn, and, for the purpose of preventing further loss of blood and to guard against instant death by admission of air into the vein, I made firm digital compression above and below the injured vein, while an assistant pushed a sponge into the wound. Hæmorrhage was controlled in this manner, and as soon as I could be relieved by one of my assistants I removed carefully the sponge, and, after locating as nearly as possible the exact seat of bleeding, I seized the vein with some of its adjacent tissues with a stout pair of hæmostatic forceps. I was fortunate enough to grasp the bleeding point at the first attempt, and the hæmorrhage was completely controlled. The tumor was now removed, and by making slight traction on the forceps the vein was drawn forward and a catgut ligature applied without isolating the vessel. I was unable to ascertain the exact size or direction of the wound in the vein, but the ligature arrested the hæmorrhage promptly and permanently. The wound was thoroughly irrigated, and, like in Langenbeck's case, the vein seemed to disappear underneath the deep tissues of the neck. In the wound could be seen the œsophagus, lateral wall of the larynx, carotid artery in its sheath, and the great horn of the hyoid bone. After suturing and draining the wound a graduated compress was applied. For the first 24 hours after the operation the patient suffered from intense headache in the corresponding side, which induced me to believe that the circulation in the vein had been completely interrupted, either by the ligature alone or by the formation of a thrombus at the point of ligation. After the first 24 hours the patient suffered no further inconvenience. The wound healed by primary union and the recovery has been permanent and complete. There is no question but that the adhesions of the cyst with the sheath of the cervical vessels were due to the attacks of acute inflammation which had preceded the operation on two different occasions. A microscopical examination of the contents showed flat epithelial cells, cholesterine crystals, fat granules, and a mass of debris, the product of epithelial degeneration.[1] The cyst wall was composed of connective tissue, thickened and infiltrated with embryonal elements and lined with flat epithelial cells.

[1] See cuts Nos. 2 and 3 on following page.

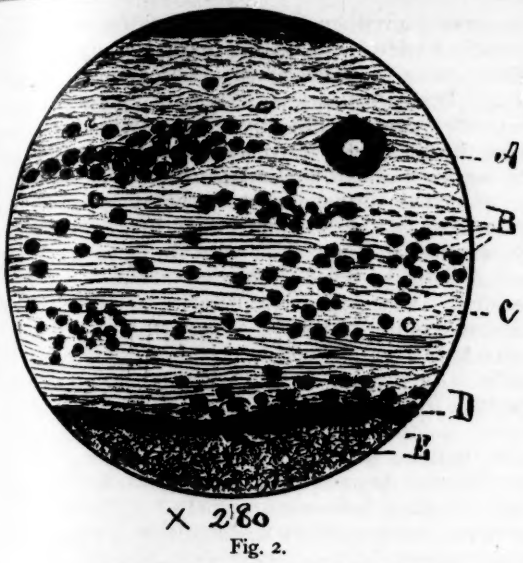


Fig. 2.

STRUCTURE OF CYST WALL.

*A*) Arteriole. *B*) Infiltrated in flammatory products. *C*) Fibrous tissue. *D*) Lining membrane. *E*) Contents of Cyst.

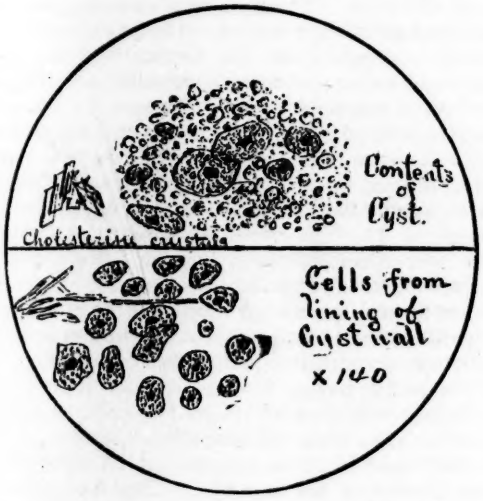


Fig. 3.

CASE II. Mrs. P., æt. 22, American. Family history good, especially in reference to congenital deformities. About a year ago she noticed on the right side of the neck near the angle of the jaw a small deep-seated tumor, which, after attaining the size of a filbert, remained stationary, at times even diminishing somewhat in size. About two months ago it began to increase in size, and became the seat of a feeling of distress and pain. When she presented herself for examination (Dec. 13, 1883), it was about the size of a hen's egg. It is located over the bifurcation of the common carotid artery, pulsates distinctly, and makes pressure against the floor of the mouth and larynx, and reaches from the lower jaw to the upper border of the thyroid gland. Fluctuation is distinct, and can be distinguished through the mouth. The skin over it is natural in appearance and movable. At the base of the tumor firm attachments fix it to the deep tissues of the neck, which prohibit any motion from above downward, while slight lateral motion is possible. The history of the case, the age of the patient, the location of the tumor in the region of the third branchial cleft, appeared to furnish sufficient evidence to justify me in diagnosing an atheromatous branchial cyst. The patient objected to an operation, and I have not been able to ascertain the subsequent history of the case.

CASE III. *Branchial cyst in the region of the second branchial cleft.* Mary H. æt. 25, German. Her family history is good, especially regarding congenital malformations, as tumors or fistulæ in the cervical region. Patient has always appeared round and full underneath the chin, but during the last four years a tumor has been growing rapidly on the floor of the mouth until, at present, it is considerably larger than a goose egg. The mouth is completely filled by it, the tongue is pressed against the palate, its movements are limited, only the tip of it being visible at the upper border of the tumor, and speech and deglutition are greatly impeded. (Fig. 4.)

Fig. 4.

Small dots in the mouth to represent the openings of Wharton's ducts.

Laterally, the tumor extends to near the angles of the inferior maxillary bone, and downward it overlaps the larynx and upper part of trachea, entirely obliterating the round contour of the upper cervical region. It is painless, and distinctly fluctuating to the touch, presents a smooth surface, and gives rise to no further inconvenience except from its mechanical interference with speech and deglutition. When the patient opens her mouth the apertures of Wharton's ducts are plainly visible on each side of the median line, and by exerting lateral pressure upon the sub-maxillary glands the patient can expel a stream of saliva from them. Previous treatment, as external application of iodine, etc., had had no effect on the growth.

*Operation.* Desiring to avoid any deformity resulting from an external cicatrix, it was decided to remove the tumor through the mouth. A linear incision was therefore made in the median line, from

above downward, extending from the tip of the tongue to the symphysis of the lower jaw, carefully avoiding the ducts of the salivary glands. When the sac of the tumor was reached, the adhesions existing between it and the surrounding tissues were easily severed with the handle of the scalpel. After freeing about one-half of the tumor in this manner it was found that it would be impossible to remove the tumor in its entirety in this manner, owing to its immense size. The sac was therefore opened and a large quantity of its gruelly contents removed by pressure. The operation then proceeded without any difficulty until the entire cyst was removed. It was now noticed that the cyst was constricted in its middle by the inferior maxillary bone, the upper and lower portions of it bulging out on both sides of the constriction. There was no hæmorrhage worth mentioning. The body and great wings of the hyoid bone could be plainly felt in the posterior recess of the wound. The cyst wall was thin, its external surface quite vascular. The microscopical examination of the contents of the cyst, as well as the primary location of the tumor, revealed its branchial origin. The wound was united with sutures, and a drainage-tube inserted. A compress underneath the chin fastened by a roller bandage, completed the dressing. The next day considerable swelling existed in the mouth, and had caused the sutures to cut through the tissues. The sutures were therefore taken out, and in place of the drainage-tube a pledget of iodoform gauze inserted, with the effect of entirely destroying the unpleasant odor which had arisen during the first 24 hours. In a few days the œdema subsided and the wound in the floor of the mouth had healed by granulation. The difficulty of swallowing and speaking disappeared, and nothing in the looks of the young lady shows any traces of the deformity which was disfiguring her face and neck previous of the operation.

*Serous branchial cysts.* This variety of branchial cysts is composed of thin cyst-walls and serous contents, and may develop from any one of the branchial clefts which fail to obliterate completely. This affection has been described under the name of *hydrocele colli* (Mannoir), congenital hygroma of the neck (Wernher), congenital hydrocele of the neck, and congenital cystic tumor of the neck (Thomas Smith). Mannoir, under the name of *hydrocele colli*, described certain serous cysts occurring between the angle of the jaw and the mastoid process, and between the larynx and the anterior margin of the sterno-cleido mastoid, a region which corresponds to the second and third branchial clefts, which were supposed not to be congenital. We have seen, however, that branchial cysts are not necessarily developed during intra-uterine life or soon after birth. All that is necessary is that the matrix for the cysts be present at birth, from which, at some future time, the tumor is developed. These tumors appear as single or multilocular cysts with thin membranous walls; their internal surface is lined with pavement epithelium. Like a serous membrane, they contain a limpid, watery, or tenacious fluid, holding in suspension epithelial cells and cholesterine crystals. These cysts are formed anywhere in the neck, within the area of branchial clefts, between the lower jaw and clavicle. They are usually deep-seated and occasionally superficial. They are painless and give annoyance only from their size. Clinically, they may be recognized from their location, their globular cystic form, soft fluctuating feel and painless growth. The existence of tesselated epithelium upon the inner surface of these cysts has been demonstrated by Neumann and Baumgarten. When these cysts spring from the second or third branchial clefts they are usually deeply located. Hueter,[1] in extirpating a tumor of this kind in a child two years of age, ascertained that it extended between the two carotid arteries back to the walls of the pharynx. When they are deeply situated they are usually in contact, and connected, with the sheath of the large cervical vessels, receiving a distinct impulse from the underlying artery. When thus located they offer the same difficulties to extirpation as the atheromatous variety. The following cases may serve as illustrations of this type of branchial cysts:

*Wernher's case.*[2] The patient was a healthy female child, which was born with a tumor on the left side of the neck, filling the whole space between the lower jaw and the clavicle, and from the ear to the median line of the neck. The tumor was smooth, tense, elastic, and fluctuating; toward the front part was a small abrasion. Respiration and deglutition were unimpaired. The tumor increased rapidly during the first ten days of the child's life. Wernher, to satisfy the mother, ordered a liniment containing two grains of pot. iod. to an ounce of oil. After a few days a small opening formed through which a dark, brownish-red syrupy fluid escaped for some days. No suppuration. The tumor sensibly diminished. After a time other openings formed in other cysts composing the growth, and the whole tumor began to shrink from the jaw toward the clavicle. Six months subsequently the child died of small-pox, and a post-mortem examination demonstrated that the tumor had completely disappeared.

*Thos. Smith's case.*[3] Geo. A., æt. 8 months. Healthy child, and well nourished. At the time of his birth a swelling was noticed behind his right ear, about the size of a hen's egg. This had gradually increased in size up to the time when he was first seen. It was then as large as a fist, and was situated in the posterior triangle, running up behind the ear and toward the angle of the jaw. The tumor was cystic, and evidently contained fluid. In parts it was tense and elastic, and elsewhere it felt flaccid, semi-solid, and lumpy. Smith passed a seton formed of a single thread of fine silk through the most prominent part of the tumor. The immediate result was to diminish the size of the swelling considerably, and subsequently to cause inflammation, suppuration, and discharge from two of the cysts. Three weeks after the introduction of the seton the cysts had quite collapsed, and the tumor had lost about two-thirds of its size. Another seton was introduced, with the result

[1] Grundriss der Chirurgie, 1880, vol. ii, p. 326.
[2] Die angeborenen Kysten-Hygrome, Giessen, 1843.
[3] Congenital Cystic Tumor, by Thos. Smith. St. Bartholomew's Hosp. Rep., vol. ii, p. 16.

of still further diminishing the size of the tumor until it was no larger than a marble.

The same author reports another case, which would show that these cysts may occasionally disappear by spontaneous absorption of their contents. The patient was a healthy babe, 3 weeks old. Immediately after birth a swelling was noticed in the neck, which rapidly increased in size. When first seen, a cystic tumor occupied almost the entire region of the left side of the neck, extending from under the lower jaw to the clavicle. The mother objected to any kind of treatment. Three months later the child was seen again, when the growth had greatly diminished in size. There was nothing to be felt but a loose, flabby cystic mass not much larger than a hen's egg. The skin over it was shrivelled, loose and baggy. Three months later the tumor was still smaller.

That these tumors may sometimes attain an enormous size, is evident from the following case reported by Frederic Treves.[1] It occurred in an infant, and took its origin in the region of the inferior maxillary bone, and occupied the whole side of the neck and upper part of the thorax on the same side, from where it extended as far as the umbilicus. It contained one large and numerous smaller cysts, corresponded to the region of the second branchial tract. No histological report of the specimen.

A very interesting description of a double branchial cyst is given by Vonwiller.[2] The specimen is contained in the Dresden Anatomical collection. The fœtus, of about 6 months, besides slight abnormities of the extremities and cleft palate, presents in the region of the neck a tumor nearly double the size of an infant's head, which is divided in the median line by a depression, which separates it into two symmetrical halves. The tumor reaches from the lower margin of the ear and the linea semicircularis of the occipital bone nearly to the apex of the scapula. Larynx and trachea free. Palpation reveals that the tumor consists of two large separate cysts. The skin over the cysts is thin and firmly adherent. The inner surface of the cysts is smooth, and resembles a serous membrane. No projections or remnants of septa can be seen. The septum dividing the two cysts is attached to the middle of the occipital bone and the spinous processes of the cervical vertebræ. It is covered with a similar membrane as the cysts, and separates them completely. The cysts do not communicate with the cavity of the cranium or spinal canal, nor with the mouth or pharynx. The inner surface of the cysts is lined with epithelium, only a small amount of solid contents composed of conglomerations of fatty epithelial cells. The anatomical diagnosis reads: Double branchial cyst—*Hydrocele colli congenita duplex*. The cysts originated, probably, in the cleft between the second and third branchial arches.

I will add another case, which came under my own observation.

Case IV. *Serous branchial cyst in the fourth branchial cleft.* The patient was a healthy, strong male child, 6 months of age. There is no history of congenital malformation, especially branchial fistula, in the family. When the child was born a small tumor the size of a pea was discovered on a level and somewhat to the inner side of the sternal origin of the sterno-cleido mastoid muscle. The tumor was painless and movable, but rapidly increased in size. When the child was brought to me, it was as large as a walnut. The skin over the tumor was natural in appearance and movable. The tumor itself presented a smooth surface. Fluctuation was distinct, but the cyst appeared to be somewhat firmly attached to the subjacent tissues. The cyst was readily enucleated, the adhesions not being very firm except over the most prominent point of the tumor, where inversion of the skin had undoubtedly occurred during the closure of the external opening of the fourth branchial tract. The adherent portion of the skin was excised with the tumor. The cyst is oval in shape, smooth, the outer layers quite vascular. The walls are thin, the contents serous, which render the whole tumor translucent. The wound was closed with sutures, and heale by primary union under an antiseptic dressing.

4. *Hæmato-cysts of branchial clefts.* In some instances of serous branchial cysts the fluid is discolored by an admixture of blood from minute hæmorrhages into the sac, but when the contents are of such dark color as to resemble venous blood they are properly called hæmato-cysts, and from a pathological, diagnostic, and clinical point of view constitute a distinct and well-marked variety of branchial cysts.

Albert[1] remarks that two kinds of these cysts have been observed: 1st. Such as may be emptied by pressure and are in communication with blood-vessels. 2nd. Those which cannot thus be emptied, and which simulate the appearance of an ordinary serous cyst so closely that their nature is only recognized by puncture. The latter class, when they occur in the neck, usually belong to the branchial cysts, because they are observed during early life and originate in places which correspond to the location of the branchial clefts. This variety of cysts has been called *hæmatocele colli*, by Michaux, and hæmatoma by J. P. Frank. Aside from their origin from branchial clefts, and the admixture of blood with the contents of serous cysts, such cysts may develop from dilated veins, both extremities of the dilated portion undergoing contraction and finally complete obliteration, completely isolating the contents of the cyst from the general circulation. Again, a vein may dilate at one point, forming a pouch or sac, and by contraction and obliteration of the orifice, a cyst is formed. Such a case was observed by Lloyd, in the region of the saphenous vein, and was described by Paget.[2] A somewhat similar case was examined by Virchow.[3] In this instance the disease was complicated by cancer, and the cyst developed from the internal jugular vein, where no communication with the vein could be found. Hæmato-cysts resemble the ser-

[1] Dissection of a Congenital Hydrocele of the Neck. Trans. Path. Soc., xxxii, p. 194. Virchow u. Hirsch's Jahresbericht, 1882, vol. i, p. 280.

[2] Ueber einige angeborene Tumoren. Inaugural Diss. Bern, Zürich, 1881. Centralblatt für Gynæcologie, 1882, p. 235.

[1] Lehrbuch der Chir. u. Operationslehre, vol. i, p. 443.

[2] Lectures on Surgical Pathology, 1853, vol. ii, p. 50.

[3] Die Krankhaften Geschwülste, vol. i.

ous cysts in every particular, with the exception of the presence of blood in their contents. Their diagnosis, however, is more difficult, and should always be made by exclusion, due attention being given to the location of the cyst, time of development, and character of contents.

Branchial cysts of the neck, as compared with other tumors in this locality, are of rare occurrence. The statistics of branchial tumors cannot be relied upon in estimating the comparative frequency with which these tumors occur, as many branchial cysts have been classified and described under the generic and indefinite term "Cystic tumors of the neck," without regard to their etiology. Gurlt,[1] in 1855, compiled 44 cases of serous, and 6 cases of atheromatous cysts. Since that time quite a number of new cases have been described by Volkmann, Billroth, Esmarch, Roser, Langenbeck, Luecke, and Burow. The serous variety is more likely to develop early; they are often congenital, or appear during infancy or childhood, while the atheromatous cysts are most frequently met with in young adults. Of 53 cases mentioned by Schede[2]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | occurred | between | the | 1st | and | 10th | year of life. |
| 21 | " | " | " | 11th | " | 20th | " " |
| 10 | " | " | " | 21st | " | 30th | " " |
| 6 | " | " | " | 31st | " | 40th | " " |
| 5 | " | " | " | 41st | " | 50th | " " |
| 2 | " | " | " | 51st | " | 60th | " " |

Like the dermoid cysts, the branchial tumors show a tendency to develop during the period of puberty, at a time when the epiblast enters upon a new phasis of development, and becomes the seat of renewed and active tissue proliferation. The remnants of the branchial cleft may remain dormant as a matrix for the future growth of the tumor for an indefinite period of time, and become the seat of tissue growth during puberty, or upon the advent of any determining cause or causes. There are undoubtedly many instances where remnants of fœtal tissue remain latent in the branchial tracts throughout a lifetime for want of an adequate exciting cause, which is necessary to call into morbid activity the slumbering forces inherent in the histological elements of the matrix.

*Diagnosis.* To diagnose the presence of a branchial cyst, is often no easy task. The importance of the tissues and organs which are in close and intimate relation with these tumors, renders it imperative upon the surgeon to make a correct diagnosis before an operation is undertaken for their removal. All witnesses should be examined carefully, and every diagnosis should be fortified by eliminating the existence of all other forms of tumors. The following conditions may simulate a branchial cyst: 1, Aneurism; 2, angioma; 3, dermoid cyst; 4, retention cysts; 5, affections of lymphatic vessels and glands; 6, struma cystica; 7, simple serous cyst.

1. *Aneurism.* As most of the branchial cysts are in immediate contact with the large cervical vessels and usually receive the impulse from the underlying artery, it is always important to exclude the possible presence of an aneurism. At the age when branchial cysts are most frequent, aneurisms, except of traumatic origin, are exceedingly rare. Pressure does not affect the volume of a branchial cyst, and the pulsations are felt only in one direction, away from the artery. Auscultation furnishes another important negative symptom. An exploratory puncture, which should always be made in doubtful cases, will also furnish valuable information, as it will afford an opportunity to examine the contents of the cyst under the microscope, and such examination will not only help to substantiate the diagnosis, but, in many instances, will by itself be sufficient to arrive at positive conclusions. In hæmatocysts, the contents may resemble venous blood, but a microscopical examination will show in addition the presence of epithelium or the products of epithelial degeneration.

2. *Angioma.* Deep-seated angiomata of the neck are occasionally met with in children, and as the skin may present a perfectly natural appearance they might be mistaken for a branchial cyst. If the tumor disappears under pressure, it may be an angioma, but never a branchial cyst.

3. *Dermoid cyst.* As dermoid cysts may occur in the same localities, and at the same age, they are frequently mistaken for branchial cysts, and *vice versa.* A number of authors classify deep-seated atheromatous cysts with dermoid cysts. As both varieties of cysts require the same treatment, a positive diagnosis is not essential. A correct anatomical diagnosis can be made by examining the contents and the cyst walls. A branchial cyst contains only one constant histological element—epithelium, as obliteration of the branchial tracts takes place long before the appendages of the skin are developed. A dermoid cyst, on the other hand, as its name implies, contains the products of secretion of the skin and the organs which it contains, the hair follicles, the sweat, and sebaceous glands. Lanuginose hair and hair follicles are never present in a true branchial cyst, while they are frequently found in the contents of dermoids. The walls of a branchial cyst are composed of a connective tissue capsule lined with epithelium, while on the other hand, the sac of a dermoid cyst is composed of true skin.

4. *Retention cysts.* The only two forms of retention cysts which call for consideration in this connection are the true atheroma of the skin, the result of obstruction in the ducts of the sebaceous glands and the retro-tracheal cyst, which originates in a similar manner in the retro-tracheal glands. Cysts arising from the second and third branchial clefts are always deeply located, and when first observed are distant from the skin, while an atheroma primarily develops in the skin, and usually grows in a peripheral direction. Branchial cysts are always congenital, atheromatous cysts acquired. Lanuginose hair is sometimes found in the contents of an atheroma, the product of retained hair-follicles; it is never seen in branchial cysts. Another important anatomical difference will be found in the outer portion of the capsule of the cyst and its relation to the surrounding tissues. In branchial cysts the capsule is quite vascular, and intimately connected with the adjacent structures, the reverse being true of the retention cysts.

[1] *Archiv für Klin. Chirurgie*, vol. xiv.

[2] Die Cystengeschwülste des Halses. Berlin, 1855.

Virchow[1] has called attention to a peculiar kind of retention cyst between the œsophagus and the trachea arising from an obstruction in the duct of one of the retro-tracheal glands. These glands are situated between the trachea and the œsophagus, but their ducts traverse the entire thickness of the tracheal wall and terminate upon the free surface of the mucous membrane. These cysts are so located that they give rise to distressing symptoms referable to deglutition and respiration before they attain any considerable size, and before their existence is suspected or detection is possible, differing greatly in this respect from the clinical history of a branchial cyst.

5. *Affections of lymphatic vessels and glands.* A deep-seated isolated caseous lymphatic gland might be easily mistaken for a branchial cyst, more particularly after the cyst had become the seat of inflammatory infiltration. Luecke[2] claims that he has observed the development of dermoid cysts within lymphatic glands. It is seldom that we meet any such extensive pathological changes in a single lymphatic gland to such a degree as to simulate a branchial cyst, without participation of one or more adjacent glands. Again, in cases of disease of the lymphatics the general condition of the patient usually indicates the existence of a serious affection, while a branchial cyst is a purely local condition, never affecting the general health of the patient, except when by compression it interferes with important functions of neighboring organs. Köster is of the opinion that many of the multilocular cysts of the neck are the result of lymphangiectasis, but in such cases a microscopical examination would show the presence of endothelia which would exclude the branchial origin of the tumor. Cancerous or sarcomatous affections of the lymphatic glands would reveal themselves by the clinical symptoms characteristic of these tumors.

6. *Struma cystica.* Cystic degeneration of the thyroid gland proper can never be mistaken for a branchial cyst, as the connection of such cysts with the thyroid body can be traced without any difficulty, but recently it has been ascertained that not infrequently small accessory thyroid glands exist in the neck which may undergo cystic degeneration, and Madelung has made the assertion that the so-called hydrocele of the neck is only a struma cystica of a supernumerary thyroid gland. The possibility of a cystic degeneration of such an accessory thyroid body should always be borne in mind in all examinations for branchial cysts.

7. *Simple serous cysts.* Virchow asserts that many of the serous cysts develop without a particular matrix, as new formations in the connective tissue. It is a well-known physiological fact that the connective tissue cells are occasionally converted into endothelia, as during the formation of new synovial membranes, hence we should *a priori* expect that in simple serous cysts developed from connective tissue the inner surface of the sac would be lined with endothelia, the existence of which would be sufficient to disprove their branchial origin.

[1]Die Krankhaften Geschwülste. Berlin, 1863. Vol. i, p. 246.

[2]Die Lehre von den Geschwülsten. Pitha u. Billroth's Handb. d. allg. u. op. Chir. Vol. ii, p. ii, p. 127.

*Cystic degeneration of the ganglion caroticum* has been supposed to resemble branchial cysts. Luschka[1] has described a ductless gland between the external and internal carotid arteries, near the bifurcation of the common carotid, to which he has applied the term ganglion caroticum. As this gland is located where branchial cysts usually are found, he has made the assertion that many of the cysts in this region are due to a cystic degeneration of this gland. To cysts originating in this manner he has applied the term *hygroma colli.* The researches of Julius Arnold, however, do not corroborate the observations of Luschka, and Virchow positively denies the glandular nature of this body.

In repetition I will enumerate the following points, which should be considered in the differential diagnosis of cystic tumors of the neck and with special reference to branchial cysts: 1. Primary seat of tumor. 2. Effect of pressure. 3. General condition and age of patient. 4. Character of contents.

*Prognosis.* Branchial cysts, although heterologous formations, always remain purely local affections and manifest no tendency to destroy life, except when they are of sufficient size to interfere by their presence with the performance of important functions of neighboring organs. On the other hand, it may be said that they manifest no tendency to spontaneous cure and prove exceedingly rebellious to all forms of treatment short of complete extirpation. The serous variety in exceptional cases may undergo spontaneous absorption, and, as a rule, is most amenable to the milder forms of treatment. After the development of these tumors, their further growth may become stationary for a short time, but their tendency is to increase in size until they encroach upon important organs, when the suffering and distress which they occasion call for decided and effective operative measures for their removal.

*Treatment.* The inner surface of branchial cysts being lined with epithelium, it is evident that obliteration of the sac can only be obtained after the destruction or removal of this epidermal lining. The radical treatment for the removal of these tumors must have for its object the production of an artificial inflammation in the interior of the sac of sufficient intensity to destroy the epidermal matrix, or complete extirpation of the cyst. The former procedure is exceedingly unreliable in its results, and extirpation in many instances must be looked upon as a very formidable and dangerous operation. The following methods have been resorted to in the treatment of branchial cysts: 1. Incision. 2. Actual cautery. 3. Seton. 4. Puncture with subsequent injection. 5. Extirpation. 6. Antiseptic drainage.

1. *Incision.* In all cases where incision was practiced, the relief from existing symptoms was prompt; the cyst collapsed, a certain amount of inflammation was established, suppuration followed, and, in some instances, the patient and surgeon were led to believe that a radical cure was obtained. Usually after healing of the wound a small nodule remained, which in a few months again became the seat of active tissue growth, and a speedy relapse was an almost constant

[1]Virchow. Op. cit. vol. iii, p. 93.

occurrence. The result was not materially modified in case the sac was drained and injected with iodine or other irritating solutions. In infants the laying open of cysts is a perilous plan of treatment. Volkers relates a case where a cystic tumor was laid open in a new-born child who died 16 days afterward in consequence of the operation. A branchial cyst cured by simple incision is reported by Billroth. In the case of serous cysts where the seton and iodine injections have occasionally been successful in producing obliteration, it seems to me that the same object would be accomplished more speedily and safely by incision and drainage, practiced in a similar manner as in Volkmann's operation for hydrocele.

2. *Actual cautery.* Dieffenbach employed the actual cautery in opening the cyst in one of his cases after he had made an unsuccessful attempt in removing it by extirpation, and after incision had failed in producing obliteration of the sac. The use of the cautery met with no more encouraging result. It would seem to me that incision combined with an energetic use of the cautery would be most applicable in the most dangerous and formidable class of cases, namely, in cysts which have become firmly adherent to the sheath of the cervical vessels by repeated attacks of inflammation. Should I ever meet with a similar case as the one reported in this paper, where the internal jugular vein was injured, I should make a free incision into the cyst, and after removing as much of the sac as would be compatible with safety and after exposing to sight the floor of the cyst, I should destroy the entire epidermal matrix of the attached portion with a Paquelin cautery. The wound could be sutured and dressed the same as after excision, by which primary union of the wound with complete destruction of the matrix of the tumor could be secured, without exposing the patient to the much greater risk of injury to the internal jugular vein which would be incurred by attempting complete extirpation.

3. *Seton.* This form of treatment proved successful in several of Thos. Smith's cases of serous cysts of the neck, but in some of them the branchial origin of the cysts does not appear to be established. Smith[1] uses a single thread of silk, and removes it before suppuration sets in. If the tumor is polycystic, he attacks only one cyst at a time. Gurlt very justly has entered his protest against the use of the seton. Like in hydrocele, the seton is an exceedingly uncertain agent in calculating with precision the amount of inflammatory action which will follow its use. The degree of irritation produced by it is very liable to be inadequate to produce adhesion, or it exceeds the desirable boundary and induces suppuration with all its evil consequences. Even the seton is not devoid of danger. Butlin reports the case of a young child where a seton was passed through a serous tumor, and which was followed by death on the third day from the violence of the inflammation.[2] For this and other obvious reasons the seton should never be used in the treatment of branchial cysts.

4. *Puncture with subsequent injection.* In the transactions of the fourth Congress of German Surgeons the treatment of branchial cysts by puncture and injection was fully discussed.[1] Esmarch's experience appeared to be the most extensive, and his results were more uniformly favorable than in the practice of any other surgeon. The following are some of Esmarch's remarks on this subject:[2]

"I have cured about a dozen cases by puncture and subsequent injection of Lugol's solution of iodine. (Iodinii, pot. iod. āā 1.25, aquæ 30.c). Against this treatment it has been urged that complete extirpation of the cyst can always be done and is free from danger. I must deny this assertion, because in a majority of cases the cyst is adherent to the sheath of the internal jugular vein, a fact which may remind you of a paper on this subject by Prof. von Langenbeck, which served as an introductory to his Archiv in 1860. In this paper Langenbeck called special attention to the dangers connected with this operation. But even if the operation were free from danger, yet by resorting to it we obtain an unsightly cicatrix in the neck, to which the female sex objects. I can, on the other hand, recommend injections of iodine as an efficacious and entirely safe procedure. If some of you have failed to see its benefits, it is, I believe, because you have not had the necessary patience and perseverance. As a rule, I have repeated the operation whenever obliteration did not promptly follow the first puncture. It is very essential to irrigate the sac thoroughly before the introduction of the iodine. I have generally proceeded as follows: By means of a fine hydrocele trocar I empty the sac of its contents, and then make repeated injections of a one per cent. solution of carbolic acid. This removes the masses of epithelium adherent to the cyst-wall. I continue these injections until the water returns perfectly clear, and then I inject 10–20 grms. of Lugol's solution of iodine, which, after gentle pressure to bring it in contact with the inner surface of the sac, is allowed to escape. The patient is then directed to return in six or eight weeks. Like a hydrocele, the cyst refills rapidly and becomes somewhat painful. If, after the lapse of time mentioned, it has not greatly decreased in size, I repeat the same operation, and tell the patient to return in six months, when the cyst will be found atrophied to a small tubercle. In most cases the cure has been permanent."

In the discussion which followed, Langenbeck said: "I have treated a number of dermoid cysts with fatty contents by means of injections of iodine, but the injections always required repetition. I punctured the cyst with a large trocar, introduced a piece of elastic catheter and made daily injections. A few cases were cured after three or four injections. In one case the tumor returned. I consider it very difficult to cure these fatty cysts with injections of iodine or any other substance."

Roser admitted that injections of iodine might succeed in serous and mucous cysts, but that they would prove of no avail in atheromatous cysts. Baum asserted that extirpation was an easy matter, and that these cysts could be removed without difficulty.

[1] Op. cit.
[2] International Encyclop. of Surgery, New York, 1884. Vol. iv, p. 663.

[1] Verhandl. der deutschen Gesellschaft f. Chirurgie, 1876, p. 25.
[2] Op. cit., p. 129.

Bardeleben believed that some of these cysts, especially those which extend behind the sternum, could not be extirpated, but obliteration in one instance was accomplished by antiseptic drainage. Volkmann spoke in favor of extirpation and warned against injections of iodine, as in case of failure they would render a subsequent excision more difficult.

It is evident that the majority of German surgeons who have given a good deal of attention to this subject have no confidence in the efficacy of iodine injections in obliterating branchial cysts. If we consider the numerous failures of iodine injections in cases of hydrocele, where the anatomical conditions for success are so much more favorable, we will be better prepared to appreciate the causes of its still more frequent failures when used in the treatment of branchial cysts. Again, clinical experience has shown that branchial cysts can be extirpated with comparative ease and safety before the cyst has become firmly fixed to the subjacent cervical vessels by inflammatory infiltration and that in this class of cases iodine or any other injections will not only prove useless, but will render a subsequent extirpation still more difficult. In infants even simple tapping is not always devoid of danger, as one instance is recorded of death caused by puncture. The case occurred to Volkers, who tapped a cystic cervical tumor in an infant eight days old, the child dying of trismus on the third day.[1]

5. *Extirpation.* A positive diagnosis made, the best plan to pursue is to make an incision over the most prominent portion of the tumor, and, in case the adhesions can be separated without endangering the deep cervical vessels, the entire cyst should be removed. If inflammatory infiltrations obscure the field of operation at the base of the tumor, and after careful examination it is not deemed advisable to perform complete extirpation, the sac should be opened and the lateral walls excised, and the epidermal matrix, which remains adherent to the sheath of the cervical vessels, can be destroyed completely by a careful but vigorous use of the actual cautery. The treatment of the wound should be conducted as in cases of complete excision. If an early diagnosis is made, and prompt treatment instituted, complete extirpation should always be attempted, and will in the majority of cases prove successful and comparatively free from danger.

6. *Antiseptic drainage.* In the case of infants and very young children suffering from large serous cysts, it would be imprudent to resort to any of the severer measures with a view to a radical cure. In such instances, drainage under antiseptic precautions should be resorted to as a temporary measure, and in some instances it may be followed by permanent results. The same course of treatment should be adopted in adults suffering from cysts which are inaccessible to any other operation, and in which irritating injections are contra-indicated.

[1] Dr. Storch, Ueber das angeborene Hygrom des Halses. *Journal für Kinderkrankheiten.* Vol. xxxvii, p. 68.

## A COMBINED VISUAL AND ASTIGMATIC TEST-CARD OF WORDS MADE UP OF LETTERS CONFUSING TO THE ASTIGMATIC EYE---REMARKS ON ASTIGMATISM, CHARACTERISTIC MANNERISMS.

BY WILLIAM S. LITTLE, A.M., M.D., PHILADELPHIA, PA.

Read in Section on Ophthalmology, Otology and Laryngology of the American Medical Association, May, 1884.

The influences of optical defects are three-fold; first, productive of vision less than normal; second, are productive of certain ocular diseases or render acute attacks of eye disease chronic by their presence; third, there are produced by their presence, headache, nervous symptoms, gastric disturbance, many cases of so-called biliousness and a chain of reflex symptoms due to the accommodative effort. Cases presenting a manifest defect of vision, seek relief by glasses, and are satisfied either partially or fully, as the manifest or total defect is corrected. In cases where ocular disease, or the form of trouble described under the third classification exists, accommodative effort may conceal the defect, which any of the mydriatics will expose and relieve the symptoms if they are the result of the optical condition of the eye; glasses are required to take the place of the therapeutic action of the mydriatic, and they represent the accommodative effort, which is not natural to an emmetropic eye.

Simple myopia or hypermetropia is productive of trouble in a small proportion of the cases under the second and third classifications, but more prevalent in the first. The myopic or hypermetropic forms of astigmatism are the more frequent condition in the last two classifications; either alone, simple astigmatism, or combined, the former with myopia, the latter with hypermetropia, compound astigmatism; or the two forms of simple astigmatism may co-exist, forming mixed astigmatism.

In a paper I read before the American Ophthalmological Society, 1880, a tabular report exhibiting the position of the axis of the cylinder in simple, compound and mixed astigmatism, the myopic and hypermetropic form compared, with remarks, (Transactions, 1880), it is stated that simple astigmatism is present in 45½ per cent., compound astigmatism in 50 per cent., mixed astigmatism in 4½ per cent. of cases of abnormal astigmatism. A continued experience in refraction imposes a stronger belief of the influence astigmatism has as an optical defect in producing trouble, especially in the third classification.

While an instrument of precision, like the ophthalmoscope, enables these defects to be recognized, by either the direct or indirect method, or by kerotoscopy or retinoscopy, the instrument must be properly handled, which is not difficult if undertaken to be learned, and though numerous visual tests already exist to enable the defect to be exhibited by a patient, they require a proper understanding to attain a diagnosis; and several tests have to be appealed to instead of one.

It has been my desire to put in the hands of the medical profession a visual test that will exhibit manifest defects more markedly, and bring out to a greater degree latent defects without a mydriatic, than I have found the various useful tests already devised seem to do, especially for the recognition of abnormal astigmatism; also, to express by the test a value for the defect as it is exhibited by the patient.

A point of light of a given size at a given distance, is sufficient to demonstrate all optical defects, especially astigmatism, certain conditions being obtained to render it fully effective; other simple methods to recognize astigmatism are the inability to recognize with equal definition, at a given distance, the radii of a circle of a given size; or call a letter O an O. Dr. Pray's astigmatic letters; Dr. John Green's test diagrams for the detection and measurement of astigmatism; Dr. Wm. Thomson's ametrometer; Javral's instrument, and numerous other valuable methods, by foreign and home observers, are at hand, based on given fixed laws in optics.

The letters in Snellen's type, or in all other letter tests, will exhibit the astigmatic defect; by the way the person tested expresses the name for the spherical and right-angled letters in the test; O is called C or G; F is called P; B is called S; the reverse holding; they distort the letters and are confused.

In simple myopia or hypermetropia with normal astigmatism, no such distortion or confusion occurs, but total obliteration of a letter of a given size, at a given distance according to the degree of the trouble.

This fact of the distortion of the letters by astigmatic eyes, has long been recognized and was spoken of by Dr. Reynolds, of Louisville, at the meeting of this Section of the Association at Richmond, in 1881; I then stated I had used this distortion, as a means of diagnosing astigmatism.

During the past year, I have been trying the value of a test, based on this distortion and confusion of letters, and now present it to the medical profession, especially general practitioners.

The letters most frequently distorted have been selected from Snellen's type and formed into a word; underneath this word have been placed the letters of the same word, as they appear to an astigmatic eye, so that a person affected, will say, that each line of letters is alike, and the word in the upper line and letters in lower line, are the same word; no dissimilarity existing as there would be to an emmetropic eye.

To give an approximate mathematical expression to the degree of the defect, manifest or latent, in myopia or hypermetropia (simple) or in astigmatisms of all forms, the size of the letters are graded in the word from D = 18 to D = 6. Four letters being taken to form the word and four letters in the confusion line below it, same grade and size of letters under one another. The word FOOL has been selected. In an astigmatism of 1. D manifest or after use of a mydriatic, the test being made from 6 meters, the size of the last letter in the word being D = 6., F. is called P; each O in turn is called C; L is called I; — PCCI underneath FOOL appears the same as FOOL itself, and are stated to be similar in appearance or nearly so. Astigmatism 0.75 D will distort the last three letters in the word at 6 meters, that of 0.50 D the last two letters, that of 0.25 D the last letter at 6 meters.

In simple myopia or hypermetropia with normal astigmatism of 1. D at 6 meters the whole word will be unrecognized and the letters underneath as well; no distortion or confusion occurring, but obliteration from spherical defect.

To obtain the position of the good and bad meridian in astigmatism, the horizontal lines, one above FOOL, the other below PCCI, will enable this to be found out by rotating them horizontally, vertically or obliquely to either side before the patient; the size of the lines are each D = 9. Cited at 6 meters, both are seen clearly in one position and not at right angles to this position, the astigmatism is 0.50 D or more, the axis expressed by the angle they are held, defect same at 9 meters also. The word COCOON D = 9, letters uniform size, if distorted at 6 meters V = $^6/_9$, 0.50 D astigmatism exists or more; A illustrates the same principal as in FOOL and PCCI, only combined in one word and in one line of uniform size; it is a very expressive test and defects are rapidly recognized by it.

For astigmatism higher than 1. D the same type must be brought nearer to exhibit the defect; but in place of this, the word NULLIFIED graded in size from D = 60. to D = 4. can be used; they are confusion letters, and in the letters above the letter D = 18., a defect higher than 1. D will be recognized from either 4 meters, or better at 6 meters; the higher the astigmatism the larger the letter confused. The word NULLIFIED has been placed at the top of the card and can be used to express visual power, as Snellen's type or others, is to be seen in full from 4 meters, the last letter in the line D = 4 thus recognized in full. V = $^4/_4$ = 1 as a letter in list as confused V = $^4/_5$ — $^4/_6$ — $^4/_9$ — $^4/_{12}$ — $^4/_{18}$ — $^4/_{24}$ — $^4/_{36}$ — $^4/_{60}$. It is to be brought nearer in higher defects; as V = $^3/_{60}$ — $^2/_{60}$ — $^1/_{60}$, the numerator of the fraction being the distance in meters from which the test is made. At 6 meters D = 6 is last letter recognized.

The word SUFFICIENT, ranging in size from D = 24 to D = 1, is also composed of confusion letters and as a confusion word, is introduced so that the test can be as accurately made in offices that are restricted in size, as well as in large ones, the last letter being D = 1, to be tested from one (1) meter. At 6 meters S, in the word D = 24, will be called B in astigmatism higher than 1. D.

I have adopted the metric system, which is readily convertible into the English foot or French scale.

Manifest defects give more of the defect to be recognized by this test, I find, than by other or more latent conditions can be detected; a mydriatic is required to give the total defect and obtain full effect in correcting all optical defects; certain ocular conditions rendering it unnecessary or dangerous; in the correction of astigmatism there is no half-way, the whole defect must be recognized under a mydriatic.

It must be looked upon as a deformity. Especially

is this so in the cases under the second and third divisions I made in the early part of the paper; for to medical men the connection of optical defects with disease are principally interesting and useful as surgical or therapeutical means to obtain relief, the same as any other plan that might be adopted. In addition to these cases, the ophthalmic surgeon is called to treat largely the first class of cases, those with diminished power from all causes, among which optical defects have a decided prominence.

The test may be made to answer a use in studying the visual field, using the word NULLIFIED at ½ a meter, closing one eye and fixing the other eye on the centre of the word and seeing it without moving the eye, the other letters can be recognized; placing the word horizontally, vertically or obliquely to either side will enable limitations or sectoma to be made out. While the test has been devised principally for the recognition of all optical defects, being founded on a scientific basis, as all such tests are, it is accurate for the correction of such defects and for proof of work done by other accepted and necessary tests at the hands of the ophthalmic surgeon.

The presence of abnormal astigmatism, especially of a high degree, can be recognized in a case, without subjecting the patient to a visual test, or an ophthalmic examination; certain characteristic mannerisms exist.

An emmetropic eye can swing around a circle, recognize a letter c with ease; the abnormal astigmatic eye is confined to a tight-rope constraint of visual power, which not only affects his sight, but his idea of objects looked at and the impressions made in his brain; he is constantly annoyed; as a person endeavoring to catch a ball with only one finger on each hand.

The position of the head, held at an angle, depending on the position of the axes of the good or bad meridian, gives them a peculiar pose; the narrowing of the palpebral fissure of the eyelids, to compensate for the defect, mars their facial expression and produces in youth the wrinkles of old age, about the eyes and forehead. The use of opera glasses, microscopes, telescopes, do not give the satisfactory results as to the perfect eye; seeking aid by spherical glasses they find none.

The design of the material of a costume, the selection of wall paper, carpets in a home, display their characteristic sight.

When the ciliary muscle gives way in the attempt at compensation, they become sufferers from bilious headache, which a darkened room and closed eyes for a day or two relieves; not the medicine taken; they begin again; till exhaustion follows again; such cases are literally sea-sick on land, on the high sea they are not sufferers from looking at the movement of the waves, as an emmetropic eye may be; to such cases with perfect eyes a pair of strong cylindrical glasses will give comfort, as the astigmatic eye finds relief in removing their correcting glass.

That certain cases of seasickness are due to annoyance from this movement of the waves, is a fact, and the suggestion of prevention by cylindrical glasses is only made to those so affected, other causes of seasickness not being considered. A personal experience with and without correction and statements from other persons so afflicted, justifies the statement of the fact. In our schools and colleges, theological seminaries and later literary life, also in the arts, astigmatism produces the greatest annoyance.

Letters and words are viewed that require a spherical eye to convey them to the retina, then to cause ideas in the brain and obtain results. Such persons work at great advantage; there is no distortion of letter, confusion of words, nor working at great odds in obtaining ideas. The astigmatic eye has its own letters and words; they are always uncomfortable, as a person translating a language with a dictionary at hand; the extra labor, uncertainty, mistakes, discouragements, often classified as stupid, render a literary life distasteful. If persisted in, health is impaired and serious lesions are produced in the eye itself. In the arts, a longer time is taken to do a given piece of work, and then not so well done.

There is no reason so potent for abolishing Greek from the schools and colleges as the inability of the astigmatic eye to recognize its characters readily, the frequency of the defect, renders it distasteful to students and a great annoyance in studying it.

The fate of a friend in scanning Homer often resulted in his teacher's saying, "sit down 'ονος,'" when he gave that word for "ωνος," and the solid contents of the book not infrequently was attracted to the master's head, as a result of the indignity to his student.

The Hebrew type in the theological seminaries, and the German type are equally as annoying. The musical score is subject to the same criticism. The Roman letter should prevail for all these languages, as that is sufficiently troublesome to an astigmatic eye, but less so than other type. German medical works are largely in Roman type, and a recent statement that 800 medical men in New York City were studying German is not to be wondered at.

I am greatly indebted to J. W. Queen & Co., of Philadelphia, Pa., for the manner in which the test has been lithographed for use by the profession.

In addition to this test, I have been using for some time an arrangement of Dr. Pray's astigmatic letters, combining them into two words under one another, PUBLIC NOTICES. It gives an opportunity to locate the good meridian quickly, and after correction of the defect, is a good proof of the correctness of the work.

The size of the lines in the letters should be D=12 or D = 9. This test has not been lithographed.

To produce a test for the near point on the plan of the test first described is not necessary, the same confusion of words after distortion of letters will be found to exist for the near as the far point. So selecting these words in the text of Snellen or others at the proper point and using the proper size, the same will be found to exist.

The effects of astigmatism are constant, and the correction of the defect requires the constant use of glasses for far and near.

DISCUSSION.

Dr. J. L. Thompson thanked the essayist for his very interesting and instructive paper, but protested against that portion of it which would dispense with a mydriatic in the examination of all anomalous refraction. He was fully convinced, after abundant proof in going over the work of others, that no man on earth has ever been able in all cases to prescribe glasses correctly without the use of a mydriatic. If he was not permitted to thoroughly examine a patient, he would not think of prescribing; but when one has thoroughly examined his patient, then he is not ashamed to have his work go before the world. He would not accept a fee in these cases unless the patient consented to this test.

Dr. D. S. Reynolds, of Louisville, Ky., said that no accurate diagnosis of astigmatism could possibly be made without the aid of a mydriatic. He had tried it in his own and many other cases, and had found no other method reliable.

Dr. S. M. Burnett—I never use a mydriatic, unless I have reason to believe there is spasm of accommodation. I am decidedly opposed to its routine employment.

Dr. E. D. Theabold, of Baltimore, Md.—I wish to enter my protest against the use of a mydriatic. We do not correct the latent, but simply the manifest anomaly, and in cases of myopia it is entirely unnecessary.

Dr. Shakespeare, of Philadelphia—I fully agree with the gentleman who first spoke as to the impossibility of correctness in many cases short of mydriasis; have astigmatism myself, and find that while I now look at the texts of the essayist, they do not lead me to his conclusions. Have examined myself before and after artificial mydriasis, and have reëxamined many others, and am fully confirmed in my belief as to the importance of this acid.

Dr. S. D. Risley—Like all of the refinements brought to our aid during the last few years, I fear that this, also, will not prove of very great practical benefit; as in my own case, while looking at the tests it does not answer expectation, so will we doubtless find when we have to deal with confused or stupid persons. Very skilful opticians constantly claim ability in this direction, and yet we see how frequently they fail in their efforts. I, therefore, declare very positively in favor of the use of a mydriatic.

Dr. L. Connor, of Detroit, Mich.—I first examine without, and afterwards with, a mydriatic; always use it where I suspect muscular spasm.

Dr. Young, of Iowa—In a majority of cases you get a different effect where a mydriatic has been used.

Dr. R. J. McKay—If the patient first looks at test types without, then with glasses, and we also examine with the ophthalmoscope, we can usually determine the astigmatism without mydriasis.

Dr. W. S. Little, in closing, said—I am a full advocate of a mydriatic, except where there is a tendency to glaucoma, or in cases where the age of the patient renders it unnecessary.

## NASAL POLYPUS OCCURRING IN A PATIENT THIRTEEN YEARS OF AGE.

BY E. FLETCHER INGALS, M.D., CHICAGO, ILL.

The following case is of special interest as a contribution to the history of mucous polyps in the nose because of the patient's age.

Growths of this character are extremely rare in patients less than sixteen years of age, and the history in this case shows that the polyps were present during the patient's thirteenth year, and may have had a much earlier origin.

Miss M— at fourteen came to me from Minnesota last July, complaining of catarrh, and difficulty in breathing through the nose, which had caused her great inconvenience for twelve months.

She had been troubled with cough and considerable expectoration for eight years, and the usual symptoms had existed several years, though not so markedly as during the past year.

Upon examination of the chest, I found the râles of chronic bronchitis, with no evidence of consolidation or emphysema. The larynx was slightly congested. The naso-pharynx relaxed and bathed in secretions, but free from abnormal growths.

Anterior rhinoscopy revealed large mucous polyps nearly occluding both nares.

These growths evidently sprang from the middle meatus or external surface of the middle turbinated bone and had the characteristic appearance and feel of myxomata in this locality.

I removed them thoroughly with the steel wire écraseur and applied chromic acid to their bases. The acid was applied by means of a flat aluminium probe upon the end of which a very small quantity had been fused by gentle heat.

Chicago, August 14, 1884.

## MEDICAL PROGRESS.

### MEDICINE.

ON THE CAUSES OF COLORED SWEAT.—Drs. Balzer and Barthélemy have been making some recent observations upon this subject, which has of late attained importance through the micro-chemical examinations reported by various observers. They confirm more especially the observations of M. Babes, who found a particular form of microbia to be present with certain micro-chemical and spectroscopic characteristics, and who succeeded in cultivating the microbia in coagulated albumen. They give first (*Annales de Dermatologie et de Syphiligraphie*) the details of a case, where in a male subject, 34 years of age, who perspired freely at all parts, the axillary sweat alone was of a brownish, or brick red color. The hair in the armpits was of a dull reddish color and wanting in pliability, irregular in calibre, and matted together.

The parts were regularly and carefully washed and bathed with cologne water, and alkaline applications were also made, but to no effect. Sulphur, corro-

sive sublimate, borax, chloral, salicylic acid, thymic acid and carbolic acid were all in turn given a fair trial in solution, but without benefit. They were used also upon the detached hairs by maceration. Aromatic vinegar seemed to have some influence, as well as chloroform; ether had the decided effect of removing the color at the end of several days.

After noting this case carefully, these observers had several other cases of red or yellow sweat from which they made preparations of the detached hairs, which were first deprived of their fatty principles by alcohol, and then mounted in glycerine or balsam, others were subjected to the action of the various staining fluids. By the use of a moderate power they were seen to be completely invested with yellow or reddish masses, frequently separated by naked spaces, giving each hair a peculiar knotted appearance. Sometimes there was but a thin, reddish layer on the surface of the hair, with others the parasitic masses were agglomerated and superposed so as to completely hide the hair itself. Radiating striæ were seen converging towards the hair, with a glutinous amorphous substance between the striæ. On using a high power these striæ were seen to be formed by chaplets of round or elliptical micrococci presenting a yellow, brown or red color. The substance surrounding and agglutinating them seemed to be of their own exudation, and was itself colored. They were attached to the epidermic layer of the hair, and particularly at eroded points. Whilst the cortex of the hair remained intact, the parasite did not extend over much surface, but when the cortex became degenerated by maceration or by the cleavage which was produced through the parasitic masses penetrating between the layers of the hair cortex, the hair was filled throughout with them. The scrapings of the epidermis also showed them in considerable quantity, but they were not all colored red; some were colorless, and masses were seen partly colored and partly colorless, with numerous microbia of a different species.

In a general way, the red sweat seems to affect especially feeble, lymphatic, arthritic individuals, convalescents or debilitated persons. It seems to occur more frequently in red, blonde, or brownish-red subjects. Since their attention was directed to the subject they have examined a number of subjects that did not have the colored sweat, and are convinced that the parasiticism of the axillary region is very common as well in those persons who are of careful, cleanly habits as in careless, dirty persons. But this parasiticism is not always accompanied by the red color, a very feeble yellowish color, or none at all is noticed. If the parasitic masses from these persons are examined, they appear like dried gummy matter; the microbia appear to be the same, but a little yellow or colorless. The abundance of the perspiration evidently favors the multiplication of the red microbia, but it would appear that up to a certain point the coloring of these micrococci increases independent of their surroundings. M. Babes considers it possible that they are contagious.

Moreover, red sweat is not confined to the axillæ, the scrapings from the inguinal and perineal region will give similar microbia, and the hairs from these regions give the same appearance as already described. This has also been seen in the hairs from the beard of certain subjects.

As to the treatment, it is well to remember that this condition appears frequently to be the result of general fatigue or debility. It is only by studying the composition of the sweat that the conditions which favor the development of the micrococci can be arrived at, and a rational local treatment determined upon.

A Case of Dystrophia and of Spontaneous Fall of the Nails in General Progressive Paralysis.—Dr. Regis (*Gaz. Méd. de Paris* and *Jour. de Méd. de Paris*) gives a case of this affection, the characteristics of which have been before noted by MM. Joffroy and Pitres during the past two years in ataxics. Dr. Regis gives his observations in a case of general paralysis, where the nail of the left great toe was very much altered in its form, texture, and coloration, looking like the scale of an oyster shell, and was ready to drop off, only adhering slightly by the root; beneath it was a little pus, which could be made to exude on pressing down the nail. On the right side the nail of the great toe was more dystrophic, and showed clearly on its superior surface alternate transverse depressions and ridges, and in its thickness a special stratification of the lower layer which was friable and pulverulent. This nail lay upon a thin layer of pus. Soon after the nail of the left great toe detached itself spontaneously, and a month later, from a slight blow, the nail of the middle toe fell off. The sensitiveness of the tissue surrounding the nails was very much blunted. The nail of the left great toe has been reproduced, but in such a rudimentary manner as to appear abortive. The nail of the right great toe has not yet come off. The nail of the right middle toe has not been reproduced.

Dr. Regis has noted this alteration of the nails in a number of cases of general paralysis. Moreover, this lesion is not limited to the toes, as with ataxics; the nails of the fingers are also attacked. The patient has had syphilis, it is true, but these deformations belonged to the general paralysis.

## MATERIA MEDICA AND THERAPEUTICS.

Direct Galvanization of the Stomach. — Dr. G. Bardet, in the *Bulletin Generale de Therapeutique*, gives us his method of employing this means of relief in cases of dilatation of the stomach accompanied with atony, and in cases of spasmodic nervous vomiting. He reports four cases, of which three were positively benefited. It seems that, while it is common to recommend the electrization of the epigastric region, the direct galvanization of the stomach by the use of special electrodes has been used but by two authorities, viz.: Perli, 1879, used this means while washing out the stomach at the same time with the stomach pump for dilatation and chronic catarrh. He used a sound ending in metallic olive-shaped extremity, and carrying a conductor in its interior, which was con-

nected with an induction apparatus. He obtained in this way vigorous contractions of the stomach, when the external conductor was placed on a level with, and a little to the left of, the ninth dorsal vertebra. Bocci, 1881, made some experiments with a gastro-electrode in the form of an œsophageal sound for the direct faradization of the internal walls of the stomach, but gave no therapeutic results. In both these instances faradization alone was used, for fear of causing eschars on the mucous membranes of the stomach.

It is evident, however, that the galvanic current would be much more to the purpose. Induced currents are very rapid, of short duration, and act but feebly upon the non-striated muscle fibres, which take time to respond to stimuli. The galvanic current excites the muscles to their maxima, and is alone capable of acting with sufficient energy to arrest the disordered contractions of these muscles.

The electrode used by Dr. Bardet consists of a rubber tube with eyes near one extremity, and a metal T tube fastened to it at the other. To one of the free arms of the metal T, which is at right angles to the œsophageal tube, a second rubber tube is attached. This tube acts as a syphon when fastened to a suitable vessel. The œsophageal tube being passed into the stomach, the electrode is passed down its interior. This electrode is made of a thin ribbon of maillechort terminating in an olive of cornuustum. The length of the electrode is calculated to pass only to the eyes of the sound, so as to insure the fact that the mucous membrane is never in contact with the conductor. A certain quantity of water is then passed through the syphon tube into the stomach, which thereby becomes distended, and the layer of fluid serves to diffuse equably the electric current over the inner surface of the organ.

As to which pole it is best to use, when it is a dilatation of the stomach that is to be treated, the negative pole would be used as producing the most active contractions; when it is vomiting and spasmodic phenomena that are to be combated, the positive pole would be the most useful. Moreover, the interrupted current would be used in dilatation, and the continued current in the other forms.

The intensity of the current in the case in which it was used by Bardet was from 15 to 25 milli-amperes, and continued from five to ten minutes. The pole which is intended to close the circuit may be held in the hand in cases of vomiting, or, in cases of dilatation, may be placed over the epigastrium attached to a broad plate of steel covered with a moist piece of chamois skin.

When the electrode is removed the liquid must also be removed from the syphon before the œsophageal tube is taken away. During the application the patient feels the energetic contractions of the stomach, which may also be felt through the walls of the abdomen on using the hand. The method causes very little pain, and can be readily used on those patients who are accustomed to having the stomach washed out by the syphon tube.

## SURGERY.

THE MODES OF PRESERVING SPECIMENS FOR MICROSCOPICAL EXAMINATION.—Prof. Cornil, while complaining (*Archives de Médecine Navale*) that many valuable specimens have been totally ruined, which were sent to him for examination in his pathological laboratory, on account of a want of proper precautions for their preservation, gives some clear rules to guard against these accidents. The reasons why these specimens were spoiled, are as follows: sometimes they were already decomposed when put into a preservative fluid; others were two large for the small amount of the preservative. Valuable spinal cords have been sent twisted up in cork-screw shape in phials containing enough alcohol simply to harden the surface, while the interior softens and decomposes. For a given specimen, the fluid which suits it best should be selected. It is often impossible to examine the most interesting parts of a specimen because a hardening reagent has not been used sufficiently early. Sometimes a brain or cord came which had been for several days or weeks in a very strong solution of chromic acid, the surface was burnt, while the interior was decomposed. Sometimes a tube is sent, supposed to contain a particular kind of bacteria, and collected without any precautions, naturally only the bacteria of putrefaction would be found. Often a big-bellied vessel is sent, with a narrow neck, through which the specimens had to be squeezed, and of course misshapen, to be inserted, and which, being filled with all sorts of specimens, had to be broken to extract them.

1. A specimen is in its best condition when taken from a living body, or as soon as possible after death, and placed immediately in an appropriate liquid. Fresh tissues taken either after an operation or during an autopsy, present a cohesion which is rapidly lost when the blood and other fluids have left them, and the cadaveric decomposition has commenced. So it is necessary to place them at once in a preservative or hardening fluid, particularly if one wishes to study the delicate modifications of the cells, or to search for the pathogenic bacteria.

2. Specimens removed in surgical operations. Portions of the tumor or member removed, should be cut into fragments that are very small in comparison with the amount of liquid into which they are to be placed. The amount of fluid should be generally twenty times as great as the size of the specimen to be placed in it. If it be simply to determine the nature of a fleshy tumor (epithelioma, carcinoma, sarcoma, myxoma, myoma, etc.) the razor or bistoury is used to detach from the centre, and from one or two points on the periphery, two or three cubes of about 1 cubic centimeter in size, washed well in distilled water, if bloody, and placed in alcohol of 80° to 90°, suspended in a vessel that will hold about 50 grs. of alcohol, with a large mouth closed by a ground glass stopper or a metal cover. Instead of suspending the specimens, they may lie upon a bed of tow at the bottom of the vessel. Cork stoppers, besides closing the vessel imperfectly, have the inconvenience of growing a mold upon their inner sur-

face; if it is necessary to use them, dip their lower portions in paraffine and seal them with wax.

To study the indirect multiplication of cells [kario-kinesis) in tumors or alterations of the skin, after selecting a part which is supposed to be in active development, it is placed immediately in absolute alcohol or in a solution of chromic acid 2–1000. Ten minutes or a quarter of an hour after the removal of the tumor would be too late. To separate the elements of a tumor, a fragment of about 2 cubic millimeters should be placed in a vessel of 30 gr., containing 2 parts of distilled water to 1 part of alcohol at 90°. The fluid should be renewed in 24 hours, if the examination is not made.

To preserve all the blood contained in vessels, or in cavernous tissue, as in an angioma, Müller's fluid should be used (20 gr. bichromate of potass., 10 gr. sulph. sod., to a litre of distilled water).

If the tumor is small, the whole of it is put in without opening it, or a lobule, if it is too voluminous. The quantity of liquid used should be twenty times greater than the volume of the specimen. To study nerves taken from a tumor, a sarcoma or myxoma of the nerves, or in the amputation of a limb, etc., a thin shred of nerve, about 1 to 3 centimeters long, should be removed by the scissors, fixed at its two ends and placed in a groove on a small splinter of wood, a match, for example, which is to be inserted in a glass tube containing a 1 per cent. solution of osmic acid. The subcutaneous painful tumors which are supposed to contain nerves, are also put in the same solution of osmic acid, the fragments must be small enough to allow the solution to penetrate into their interior, and should not be more than 2 millimeters thick, and 6 or 7 millimeters long. After remaining 24 hours in five times their volume of osmic acid, they are to be washed with distilled water and put in absolute alcohol.

To preserve the specimens for examination with the naked eye, a temperature of 32° to 46° F. will keep them for several days without change. Otherwise, chloral in solution of 10 p. 100, preserves very well the appearance and color of the parts; the liquid should be renewed if it becomes muddy, and the specimen should be suspended in ten times its own volume of the solution.

Alcohol is the best preservative; to use it properly, the specimen should be washed for 24 hours, in a large vessel where a current is established from the bottom by rubber glass tubing, and then placed in alcohol, so as to be bathed by it at every portion, the dissected or isolated parts to be suspended by threads from glass rods. Another way is to wash the specimen quickly, then place it in half alcohol, half water for two or three days, and then to put it in alcohol of 80° or 90°. The advantage of the alcohol is that it allows of an ulterior microscopic examination, which other liquids do not. But whatever means are employed, the specimen will lose its color and become blanched.

3. To obtain the bacteria from a liquid (purulent discharge from the genital organs, pus, sputa, fluid of cutaneous eruptions, leprosy, variola, etc., liquid of thoracentesis, abdominal punctures, etc.), a very clean bistoury should be taken, which has been washed in alcohol and heated in a flame, on the point of which a drop of the liquid is taken up and spread upon a thin layer of glass, which has been washed with water and with alcohol and dried with care. This is covered with a similar piece of glass, which has been treated in the same way, and the delicate layer of fluid will dry rapidly, they are then wrapped in paper. They can be kept one or two days before being used. The blood obtained by pricking the finger after a careful washing with soap, and then with alcohol, can be prepared in the same manner, only to preserve the red blood globules, the glass must be exposed for a quarter of an hour in a moist chamber to the vapors of osmic acid. As the urine dries very slowly, owing to the hygrometricity of its salts, a very small quantity should be taken and dried over the lamp flame. The meatus must be washed with care, and the material taken during micturition. With women it is nearly always mixed with the secretion of the vulva and vagina.

Twenty-four or thirty hours after death in summer it is useless to search for bacteria; but if the cadaver has remained at a temperature of 32° to 46° F., at the end of twenty-four hours they can still be found, and prepared as above, in, for example, the fibrinous exudation of serous inflammations, pneumonia, the scrapings of the liver, the kidneys, lymphatic ganglia, the pultaceous fragments or soft vegetations of rheumatismal or ulcerated endocarditis, the pus from the abscesses of internal organs, the contents of tuberculous cavities, of syphilitic gummata, the intestinal fluid, the surface or bases of ulcerations of typhoid fever or dysentery, the contents of the articulations in arthritis, etc. etc.

In looking for bacteria in tissue sections, they should be taken from the living body, as a small portion of the skin or subcutaneous cellulc–adipose tissue detached from the border of an incision made in opening an abscess, or a minute section made with the patient's consent, from a tubercle of leprosy or lupus, or in erysipelas, etc. These fragments of one or two millimetres in thickness by 8 or 10 inches in length, are placed at once in a phial containing alcohol at 90°, which is the best for them, although it contracts them a little and reduces their dimensions.

4. Precautions recommended for certain organs and tissues particularly. *Skin.* As many of the cutaneous eruptions blanch out after death, so as to be no longer recognizable (spots of typhoid fever, erythemata, superficial papules, etc.) it is well to mark them before death, with aniline or nitrate of silver. The parts so marked to be taken as soon as possible and put in alcohol, Müller's fluid, or osmic acid.

*Nervous System.* Bichromate of ammonia 2–4 p. c., sections to be made carefully. In tuberculous meningitis, two convolutions with the pia mater covering them undisturbed may be placed in alcohol. Very small fragments of the brain and cord may be put in osmic acid to study fatty degeneration.

The reagents mentioned are all useful in preserving the various parts of the body in a simple manner, as to the *Eye*, to preserve the retina, osmic acid should be injected as soon as possible by a fine (Pravaz)

syringe, through the sclerotic into the vitreous humor, twenty-four hours later the globe is to be cut through and placed in distilled water for an hour and then put into alcohol. This can be done after the surgical enucleation of a diseased eye; or it can be placed whole in Müller's solution, taking care first to prick the sclerotic in several places to allow the preservative fluid to penetrate into the interior.

PERFORATING WOUND OF THE HEART.—J. Landborg (*Nordiskt Medicinskt Arkiv*) gives the case of a man 53 years of age who had been an inmate for six years of an asylum while suffering from dementia. During that time he had satisfactory general health and a good appetite, until finally he took to his bed, refused food, but drank a good deal, seemed very weak, but did not complain of anything, perspired excessively, nothing abnormal about the thorax, heart sounds normal, pulse full and regular. He died within three days.

At the autopsy the folds of the pericardium were found to be agglutinated by strong trabecular adhesions. In the muscle fibres of the heart, posteriorly and 1.5 cm—above the apex there was a sail-maker's needle, penetrating through the walls of the left ventricle, with the head entirely within the cavity. It had formed about itself, on the walls of the heart, an infundibuliform opening, circular on the surface, with a diameter of 1 cm. Corresponding with this opening was one in the parietal pericardium, following which a canal was found passing beyond the pericardium and the diaphragm to the left lobe of the liver and the wall of the stomach, these organs were all adherent each to the other. When the parts were in situ and the needle in its original position, its point was free in the stomach; and so closely adherent was it to the tissues, that no fluid could be made to penetrate the intermediate space. In spaces where the point of the needle could reach the opposite side of the stomach, the mucous membrane was slightly scratched with traces of injection. No hæmorrhage. The needle was 9 cm long, triangular, and rusty in its superior portion, a part of the eye of the needle still remained.

## OBSTETRICS AND GYNÆCOLOGY.

ON NON-BLENORRHAGIC VAGINITIS.—Dr. Martineau has published his views on this subject at some length, a review of which is to be found in the *Archives de Tocologie*. As to the structure of the vagina, he does not admit the presence of glands, and limits his study to the constitutional and non-constitutional forms of vaginitis. Constitutional vaginitis develops suddenly, or consecutive to an irritation. It may be under the influence of a gouty, scrofulous, herpetic, or dartrous constitution, of which the author has observed about thirty cases. It may exist alone, which is rare, with metritis, or with constitutional vulvitis, which is more common. With herpetic vaginitis generally the cutaneous system is also involved by the same disease.

The secondary constitutional vaginitis is quite frequent, and results from menstruation, pregnancy, labor, metritis, traumatism, masturbation, coitus, horseback exercise, and the frequent introduction into the vagina of pessaries, injection pipes, etc. The symptoms vary according as the vaginitis is acute or chronic, constitutional or non-constitutional. When acute it commences with a sensation of heat and dryness of the vaginal mucous membrane; then follows a secretion, which passes by degrees from a mucous, colorless character to a white, purulent and even greenish character. The quantity is variable. The secretion is but the product of a simple exudation, an exfoliation of the most superficial layer of the mucous membrane. The microscope shows numerous globules of pus, a considerable quantity of epithelial cells, the *trichomonas vaginalis*, and a certain number of algæ and vibriones.

Later, the pain increases and irradiates through the pelvis, the vulva become red and inflamed, but there is no *urethritis*. Finally, there may be inflammation even to suppuration of the perivaginal and inguinal ganglia. The touch, which is painful, encounters the folds of the vagina, prominent, rugous, and covered with granulations. The speculum when introduced causes a slight bleeding from the inflamed surfaces, and passes in with some little difficulty. It exposes the intense redness of the mucous membrane, which is covered by a layer of pus. The cervix uteri partakes of the inflammation, and presents erosions, which, however, do not pass into the interior of the neck. The granulations are due to an hypertrophy of the normal papillæ, and not to any glands. Constitutional vaginitis, on the other hand, is rarely acute, and Dr. Martineau recognizes several varieties:

1. Scrofulous vaginitis, which may or not be granular. It is characterized by a discharge that is rather sero-purulent than purulent, and by the presence of disseminated small vesicles, situated either lineally on one or all parts of the walls (herpes), or grouped in small patches which are slightly prominent and irregular in form (eczema), not confined to the vagina, but also present on the cervix uteri.

2. Arthritic vaginitis, which is characterized by an intense redness, almost the color of urine lees, of the vaginal mucous membrane. Its progress is irregular, its duration prolonged, it is subject to relapses, which seem to be dependent upon the variations of temperature, the humidity of the atmosphere, and sudden cold. It is coincident with other evidences of arthriticism, as muscular and articular pains, neuralgia, etc.

3. Dartrous vaginitis. This is accompanied by vulvar-lumbo-abdominal neuralgia and crural neuralgia, the vulvar hyperæsthesia may become true vulvism with contraction. (?) The herpetic and eczematous eruptions are numerous, and are generalized on the vulva, vagina and cervix uteri. They coincide with morbid manifestations of the same nature, either on the external integument or in connection with the viscera.

The diagnosis comprises the diagnosis of the lesion, or anatomical diagnosis, of the cause or pathogenic diagnosis, and of the nature of the affection or nosological diagnosis.

Dr. Martineau insists particularly on the different characters of the discharges from the vagina, uterus and vulva.

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THE EDITOR of this JOURNAL would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information, should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor.

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TREATMENT OF EPIDEMIC CHOLERA BY LARGE HYPODERMIC INJECTIONS OR INFILTRATIONS.—A few weeks since we published a brief communication from Dr. S. S. Todd, of Kansas City, Missouri, proposing to treat cases of epidemic cholera largely by injections of considerable quantities of whisky and water into the subcutaneous areolar tissues, with the expectation that it would be taken up fast enough to prevent the blood from becoming too much exhausted of its water and saline elements by the copious gastric and intestinal evacuations which accompany the active stage of the disease.

In the present number we give place to a letter from Dr. Uhler, of Baltimore, touching the same subject. He commends the object sought to be accomplished by Dr. Todd, but thinks that the direct injection, by large hypodermic syringe, of sufficient fluid for the purpose, would rupture the subcutaneous areolar tissue and lead to extensive suppuration. To obviate this he suggests a method by which the fluid could be more slowly and continuously introduced into the tissues or directly into the cavity of the peritonæum, from which it would be rapidly absorbed by the peritoneal membrane.

All these suggestions are founded on the assumption that the chief danger from cholera is in the loss of the water and salts of the blood, leaving that fluid too viscid to circulate; and that a supply of these elements as fast as they are lost would result in curing the disease.

Our own clinical experience with cholera, suggests that there would be much practical difficulty in carrying out the propositions of either Drs. Todd or Uhler. To inject hypodermically from 60 to 120 cubic centimeters (fl. ʒii to ʒiv) of any kind of liquid directly into the areolar tissue of an extremity, and repeat it often enough to make any adequate offset to the quantity being discharged from the mucous membranes in the active stage of cholera, would necessarily rupture and disorganize that tissue, as stated by Dr. Uhler. And to keep four or more hypodermic syringe points constantly inserted and connected by rubber tubing with a fountain containing the liquid to be infiltrated into the tissue, as proposed by Dr. Uhler, while the patient is vomiting, purging, and writhing under the muscular cramps every five or ten minutes, would require more fortitude and patience in preserving one position, than I have ever seen in persons in the active stage of this disease.

If we wait until the patient gets quiet enough to keep Dr. Uhler's apparatus adjusted, continuously, it will be when he is in so profound a collapse that the capillaries will fail to take up the infiltrated liquid. What effect the injection of water, or medicated water, into the peritoneal cavity during the progress of a case of cholera, would have, can be determined only by trial. We apprehend, however, that all these expedients, even if carried into practical effect, would lead to the same result as has been found to follow the direct injection of various diluent liquids into the veins, namely, a temporary improvement of the circulation, followed shortly by renewal of intestinal discharges and return of the collapse. The truth is, that the rapid drainage of the serous fluids of the blood and tissues is simply an *effect* resulting from the inversion of the natural action of the mucous membrane of the alimentary canal; and until this inverted action is reversed, the mere supply of water or any artificial serum, whether it be by hypodermic infiltrations, venous injections, or injections into the peritoneal cavity, will only furnish additional material for discharges, without otherwise altering the progress or final termination of the case.

MORPHINE IN THE EARLY STAGES OF INSANITY.—The responsibility of the physician in the use of morphia, in consequence of the possible development of the morphia habit, is great; but his responsibility relative to the possible disaster of a preventable life-long insanity, not prevented, is, if possible, still greater.

Auguste Voisin,[1] of the *Salpètrière*, Paris, claims

[1] Leçons Clinique sur les Maladies Mentales, etc., Paris, 1883.

for the use of the hydrochlorate of morphia, in gradually increased large doses long maintained, remarkable results in the treatment of certain forms of insanity. His theories are well sustained by physiological observations, and his cases are taken from the records of the *Salpètrière* and private practice, and many of the cases have been examined after the lapse of several years.

In the article referred to, "Leçon Trentième," he gives a resumé of the history of the systematic use of opium and morphia in the treatment of insanity, and dates his own experience with it from the year 1867. His success was at first greatly diminished by the obstinate vomiting which frequently occurs; but on learning from M. Roller, Physician of the Insane Asylum at Illenau, France, that, regardless of the vomiting, the dose should be increased, he continued to increase the dose, and to that instruction he attributes his success. He has since treated successfully the various manifestations of insanity which would seem to correspond practically to the first division adopted by the International Congress of Alienists in 1867, namely: simple insanity, comprehending mania, melancholia, monomania, circular insanity, moral insanity, in their early manifestations.

He uses exclusively the hydrochlorate of morphia, and only hypodermically, but fails to give the strength of the solution which he finds most satisfactory. He does not mention the combination, so much appreciated in America, of morphia and atropia. Probably the association of the atropia is not to be desired. He speaks against the tablets in use, and especially objects to warm water as a vehicle. The efficacious dose desirable to sustain until the desired effect is obtained, can only be found by proceeding cautiously and studying each individual apart. One rule which the author never departs from, is not to exceed, in the initial dose, from one to three milligrammes. Whilst light cases associated with hallucinations are frequently relieved in a few days with a daily dose of from five to six centigrammes, yet in other cases the dose has to be increased to seventy centigrammes. He narrates one case in which two grammes of the hydrochlorate of morphia, in two doses, were administered daily, with no manifestation of its presence beyond a contraction of the pupils. The latter was one of the unsuccessful cases. He never entrusts the administration to a nurse.

The influence of the medicine exhibits itself in the order of their appearance by a redness of the face and conjunctivæ, nausea, vomiting, general sensation of heat, lassitude, sleep, loss of weight, diminution of arterial tension; later, an improvement of the countenance is manifest, the face becomes more intelligent and the tint of the flesh improves, the general weight now increases, and in women, the courses reappear. The manifestation of any of these symptoms supports a favorable prognosis, whilst their absence is unfavorable. Where there is great emaciation, previous to the commencement of the morphine treatment the author practices transfusion. The presence of a congested condition of the cerebro-spinal system he considers an absolute contra-indication for the use of morphia. Consequently in some cases he first applies blisters to the nape of the neck or other convenient regions, and regards its use as absolutely contra-indicated in epilepsy, general paralysis, and insanity due to an atheromatous condition of the arteries.

He mentions three phenomena which he considers of importance in pronouncing an opinion relative to the cure of the patient: The consciousness of their former condition, the recollection of their delirium, and a sense of gratitude towards those from whom the relief was obtained.

Judging from a purely theoretical point of view we should say that the plan of treatment is eminently philosophic. It is not at all unreasonable to suppose that many such cases may arise from an exaggerated form of ordinary sadness, suspicion, or diluted but universal pain, associated it may be with a condition of body incapable of throwing off the superimposed incubus. Let us suppose, for instance, that the pain associated with a severe felon, a toothache or earache, instead of being confined to one place, disseminated over the whole body so that the sufferer cannot locate his seat of pain; the pain would not necessarily be the less because it was thus distributed, the patient would, however, be very much less likely to obtain relief from the physician; and we have only to suppose that general feeling increased and unrelieved to disturb the equilibrium of the best of us. If, as we are led to suppose by Auguste Voisin, the arterial tension is constantly increased in the initial stages of insanity, it would not be unreasonable to suppose that in such cases some such universal agent is at work, and from our experience with morphia as a magic power in the relief of other affections of a painful, ease-disturbing nature, we ought to expect it to be equally efficient, at any rate in certain cases of insanity, arising apparently from an ill-defined but universal pain, whether physical or moral.

Such a method of treatment offers special advantages in the possibility of saving a patient from being sent to a retreat, which is sufficient in itself, in many

cases, to develop a spirit of resentment which would add to the chances of a relapse. As to the possibility of developing the morphia habit, it would be very injudicious to ignore it; but in urgent cases risks have to be taken, and by following the example of Auguste Voisin in allowing the remedy to be administered by the physician alone, the danger is reduced to a minimum.

PROGRESS OF CHOLERA IN EUROPE.—While the epidemic in Toulon and Marseilles is diminishing, apparently for want of material to feed it, it is steadily extending to other parts. A dispatch of the 16th inst. says:

"There are now forty-one places and thirteen departments in France from which deaths from the cholera have been reported, and there are doubtless half as many more towns and villages from which no reports have reached the world outside. The cholera area now stretches from Toulouse, in the southwest, to Auxerre, in the north, in the department of Yonne, and to the gap in the southeast in the Haute Alps, thus making a triangle whose sides are respectively 235, 245, and 310 miles long. Auxerre is only about 100 miles from Paris in a southerly direction."

It also exists in many places in northern Italy, and in the Nostras prison at Geneva, Switzerland.

What is called *English Cholera*, has been for some time prevailing with considerable severity in Northampton and neighboring villages, in England.

INTERNATIONAL MEDICAL CONGRESS AT COPENHAGEN.—This body closed its session according to programme on the 16th inst. The number of members present is stated at about 1,600, of whom about fifty were from this country.

SUPPOSED DUPLICATES OF JULY 19, 1884.—If there are any of our readers who still think they have received *two* copies of the JOURNAL for July 19, Vol. III, No. 3, and no copy for July 26, Vol. III, No. 4, let them compare the supposed duplicate numbers by examining the date and number at the top of the first inside page of reading matter, as well as the contents of the two copies, and they will find that they have both numbers *three* and *four*, the latter only being wrongly dated and numbered on the front outside page.

INTERNATIONAL MEDICAL CONGRESS.—A dispatch from Copenhagen of the 13th inst., stated that Dr. J. S. Billings, of U. S. A., and delegate from the American Medical Association, had presented to the Congress there assembled an invitation to hold the next triennial session in this country in 1887. If the invitation is accepted, those who attend will meet a cordial reception from the profession in this country.

# SOCIETY PROCEEDINGS.

## GYNÆCOLOGICAL SOCIETY OF BOSTON, MASS.

The Society met for its regular February meeting, H. O. Marcy, M.D., President, in the chair, and H. G. Harriman, M.D., Assistant Secretary.

Dr. Marcy again thanked the Society for the recent honor of his unanimous election to the chair. He realized the responsibilities of the position, but had concluded to accept it, although full of zeal for the greatest good of the Society, because he believed, after all, that the effective work must still be done by the "rank and file." In the year to come he would use his efforts to advance every interest of the organization, and render it an aggressive force both at home and abroad.

Frank S. Billings, M.D., associate member, then read the paper of the day, upon "Eclampsia Parturientium in Woman and in the Cow," of which a digest follows:

As respects etiology, eclampsia is the most theoretical of all diseases. Derivatively speaking, the term is applicable to but a single one of the many phenomena which it is made to cover. Usage has also restricted its application to such phenomena occurring in woman during the *puerperium;* but, in reality, it equally applies to similar conditions occurring in scarlatina, diphtheria, etc. Convulsions in parturition would be a better designation than eclampsia.

Eclampsia is not a disease; rather it is a symptom of a diseased condition of the organism. It represents a result, the outward visible phenomena by which certain internal disturbances manifest themselves to the observer.

*Definition.*—Other medical men agree more fully regarding the nature of the disease than do veterinarians. Frank alone, among veterinary writers, looks upon the accident commonly called milk fever, calving fever, collapse, etc., as identical with eclampsia in woman. He defines to the following effect: An acute and very dangerous disease in cows, especially common in the great milk-producing breeds, characterized by unconsciousness, paralysis, and sometimes convulsions, due to uræmia of the brain.

The reason why convulsions are not so frequent and so severe in the cow as in woman, is that the degree of nervous irritability in the bovine species is much lower.

*Eclampsia in woman* Spiegelberg defines as epileptoid convulsions of a tonic, or, more especially, of a clonic character, which appear during the puerperium, accompanied by unconsciousness and coma. Nothnagel regards it as an acute epilepsia. Wernich connects it with injury done to the ischiatic nerve, by the uterus, which produces excitability to the pons and the medulla oblongata. If to this assumed injury be added irritation of the nerves of the general system, eclampsia results.

The reader next gave a full exposition of the cause and phenomena of this disease, in woman and in the cow, of which the following is a brief *resumè:*

In woman the affection is essentially one of parturition, but it may occur in other diseases. Eclampsia in animals is almost entirely limited to parturition —being even more restricted than in woman—but seldom occurs even then in other animals than the cow. Prodromal phenomena are present in woman, and probably also in animals. Amaurosis is a constant attendant in both; œdema of face and extremities present in woman, but not in animals; convulsions frequent in woman, infrequent in animals; pulse and respiration similarly affected in both; temperature increased in woman, decreased in animals; bladder contains little urine in both. Secretion of milk either diminishes or ceases altogether in animals; nothing reported in regard to woman. In animals we find complete paralysis of digestive tract, cessation of defecation, and dessication of the fæces. Tympanitis present in cows.

*Etiology.*—The only two theories worthy our present recognition are, 1st, the Traube-Rosenberg theory, to the effect that eclampsia is due to œdema cerebri and the sequential anæmia; 2nd, that it is due to intoxication of the blood with the entire elements of the organism which go to make up the urine.

Objections to the T.-R. theory are numerous. Convulsions occurring in scarlatina, diphtheria, etc., are *not* due to œdema cerebri, but *are* due to nephritis and to consequent retention of elements in the blood. Still, all cases of nephritis and retention of elements of urine in the blood are not followed by eclampsia; therefore an unknown something must be involved in the production of the disease besides urine-intoxication. This something may be prolonged action on the nervous elements, or sudden and intense action. According to the urine-intoxication theory, the blood-intoxication is not due to retention of urates alone, but of all the elements of the urine. The semi-paralyzed condition of the muscles of respiration doubtless aids this toxic influence of the urine by interfering with the oxidation of the blood.

Spiegelberg, Cohnheim, *et cet.*, were quoted in support of this latter theory.

There are many predisposing and supporting circumstances connected with the procurement of eclampsia in the cow. Nephritis, which is so frequent an antecedent in woman, is not often present in the cow.

The disease is always associated with a quick and easy parturition, and the contraction of the uterus is speedy and prompt. Eclampsia seldom comes on before the delivery of the secundines.

It appears to belong especially to the great milk-producing breeds, and is, essentially, a product of refinement in breeding. Over-feeding and an over-fat condition of fine-bred cows predisposes to the evil. It seldom occurs during the first or second parturition, and diminishes in frequency after the seventh or eighth; it therefore appears most frequently at the height of milk production.

In conclusion, the reader gave his own opinion respecting the etiology of the disease in effect as follows: Eclampsia parturientium is due, 1st, to a peculiar irritability of the uteral plexus, producing a neurosis which acts, 2nd, upon the arterial circulation, especially in the kidneys, causing retention of urine-elements in the blood and tissues; to which may be added the statement that anæmia cerebri may be due to the same reflex irritation which causes contraction of the renal arterioles.

After the reading of the paper, the chair suggested that the discussion which was to follow might very profitably be directed towards the treatment of eclampsia, as the reader, from lack of time, had not considered this department of the subject.

In reply to question, Dr. Billings said he did not know whether paralysis of the bowels existed in women as it does in cows. Cows are purged at once, and other efforts made at elimination.

Dr. Warner asked if cessation of defecation was due to paralysis or to spasm. Reply—It is certainly due to paralysis.

Dr. M. L. Brown thought purging was striking at an effect rather than at a cause, and that something calculated to allay nervous irritability, chloral hydr., e. g., would be better. Morph. sulph., in large doses, (gr. ss., gr. ij.,) would fill the same indication. Army service taught him that pressure on both carotids would sometimes control convulsions.

Dr. Billings, in reply to question, said that chloral hydr. was not used with cows. Physostigmine, (8–10 grs.) had been used, in conjunction with enemata, hot blankets, etc. Blood-letting has been abandoned.

Dr. Wheeler had not noticed cessation of milk in woman, as patient is either dead or relieved before milk appears. Neither had he observed arrest of defecation in woman, but was accustomed to purge both in order to eliminate and deplete.

Dr. Grainger had not observed intestinal paralysis in woman, and thought it would have been noticed if it were present.

Dr. Billings rejoined that stagnation of peristalsis in cattle came on suddenly. The last operation of the bowels previous to eclampsia may have been normal; as soon as the attack supervenes, the bowels are wholly paralyzed and the fæces rapidly become dessicated.

Dr. Grainger would not trust to chloral hydr., had tried it and failed. Had successfully tried venesection, with pilocarpin hypodermically.

Dr. Billings believed venesection to be generally of little value; if used at all it should be resorted to in the beginning of the attack, and should bleed freely.

Dr. Marcy had used pilocarpin with varying success, but was not satisfied with it. In his last case, had found fatty degeneration of capillaries of kidneys. Venesection was advisable in certain cases. Had lately seen a case where a history of albuminuria for several months was followed by normal labor.

Dr. Wheeler thought we should recognize two types of the disease, and these should receive different treatment. One, the sthenic, found in patients who are strong, full-blooded and robust, with tendency to apoplectic symptoms. The other type is presented by the anæmic and nervous. In the former class, venesection should be used, followed by morphia or ether; with the latter, venesection is contraindicated, and ether, morphia, etc., must be our chief depend-

ence. In reply to a question of Dr. Horace White, Dr. Wheeler farther said he did not think pilocarpin would deplete quickly enough in some cases, in which venesection, quite likely, would work much better.

Dr. Grainger mentioned a case of albuminuria where the urine was nearly solid on boiling, patient had moreover spots before the eyes, ringing in the ears, etc., etc. The labor was normal. Venesection in proper cases should be resorted to very early, and the patient bled rapidly, in sitting posture, so as to affect the brain at once.

Dr. Church thought the presence of albumen not particularly dangerous if the amount of urine be not diminished; if, however, the urine be both scanty and albuminous, labor should be induced.

Dr. M. L. Brown had used veratrum viride with good results. As soon as the pulse reached the normal, convulsions ceased, though in one case delivery did not take place till 24 hours afterwards. But veratrum viride is not applicable to all cases, as it is not rapid enough in its action.

Dr. Wheeler had found the uterus firmly contracted after delivery in cases complicated with eclampsia. Dr. Billings did not know of any epidemic form of the disease among animals.

Jas. R. McLaughlin, V.S., of Newton, being present by invitation, was asked by the Chair to give the results of his observation upon the subject before the Society. The doctor replied that the veterinarian generally labored under the disadvantage of being called to the case late, and after the animal had been down some hours. His chief effort in treatment was in the direction of elimination, and this by the bowels, which were, of all organs, the most susceptible to impression in the cow. Gave strong cathartics, as a very positive form of constipation is always present; also employed hot applications to the loins, in neighborhood of kidneys—cloths wrung out of hot water and confined with rubber cloth to prevent evaporation, also frequently gave warm ale, in Oss. doses, repeated every four hours. The majority of cases die, and when recovery does take place, it is a question with many of the profession whether the actual disease were present, and not rather a hysterical sophistication of it. In one case with favorable issue, the animal had right afterwards a well-marked case of pneumonia, but finally recovered from this also. She was a rich milker—milk like cream. A year previous to the seizure, he had treated her for œdematous swellings all over the pendent portions of the body, legs, udder, etc.; when she came to have her first calf it was complicated by the experience just related.

The doctor further remarked he had made a number of post-mortems but never found anything calculated to throw light either on the nature of the disease or its treatment. Confinement in cellars seems to predispose to eclampsia; had lately been consulted in case of a valuable cow owned by a wealthy family, which had had successive seizures on occasions of previous calvings; advised to remove her from the cellar in which she was kept, and to build a proper barn. Also pursued depletory measures, ordered a regulation of exercise, and when she came to have her calf all proceeded well and without complication. "The poor man's cow," added Dr. M., "like the poor man's wife, generally gets on well and escapes the disease."

At the close of the discussion, Dr. Billings called attention to, and presented sample copies of, the "*Journ. of Compar. Medicine and Surgery*," of which he is one of the editors. The doctor also recommended a soap consisting of Bals. Peru 20 per cent. powd. Castile soap, 8 per cent., as having proved effectual in the relief of eczema, dandruff, leucorrhœa; also effective in removing offensive odors from the hands. Great difficulty is experienced in making these ingredients unite, but it can be accomplished. Dr. B. recommended the following for the disguise of the smell of iodoform:

℞ Iodoform.....gr. ci.
Acid Carbolic .....gr. ij.
Ol. Menth. Pip .....gtt. v—x.

Society adjourned.

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### CHICAGO MEDICAL SOCIETY.

Regular meeting August 4, 1884, Dr. D. A. K. Steele, President, in the chair, and Dr. L. H. Montgomery, Secretary. After the preliminary business, the remainder of the evening was occupied in the consideration of epidemic cholera. Dr. J. H. Etheridge read a brief paper enumerating the various remedies that had been proposed and used in the several cholera epidemics of the past 60 years. He did not discuss the *modus operandi* or the therapeutic value of any of the remedies, but simply gave a catalogue of such as had been suggested and used to some extent during each successive epidemic. The list embraced nearly 130 articles, among which were some of the most active in the materia medica, as calomel, opium, venesection, cathartics and emetics, and many that were entirely inert. He was followed by Dr. I. N. Danforth, who gave an interesting account of the pathological changes or morbid anatomy of cholera patients, illustrated by micro-photographic representations of the mucous membrane of the ilium as shown by post-mortem examination of persons dying of cholera in 1873; also, similar illustrations of the constituents of the matters vomited and passed from the bowels before death. His examinations showed the uniform presence of three pathological conditions as the result of fatal attacks of epidemic cholera, *i. e.*, great loss of the water and saline constituents of the blood, leaving it too thick to circulate freely through the capillaries and smaller vessels; an abundance of epithelium cells and several varieties of microbes in the intestinal evacuations; and extensive denudation of the villi and other parts of the mucous membrane from the detachment of the epithelium during the active stage of the disease. In nearly all the cases, the cortical structure of the kidney was also much congested, and the secretion of urine scanty or suppressed.

Dr. W. T. Belfield gave a brief account of the investigations of Dr. Koch in regard to the cholera bacillus. He regards it as not yet demonstrated that

said bacillus is the efficient cause of the cholera pestilence.

The discussion was continued by Dr. John Bartlett, who had in former years devoted much time to the investigation of the organic germs or fungi supposed to constitute the active constituent of malaria; Dr. C. G. Smith, Dr. C. W. Earle, and Dr. N. S. Davis. The latter, in addition to some reminiscences of the several cholera epidemics in this city from 1849 to the present time, gave briefly his views of the pathology and the method of treatment he had found most efficient in controlling the progress of the disease. At a late hour the society adjourned, with the intention of resuming the discussion at the next regular meeting.

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## MASSACHUSETTS MEDICAL SOCIETY.—PROCEEDINGS OF THE SUFFOLK DISTRICT MEDICAL SOCIETY.—ADJOURNED SPECIAL MEETING.

Section for Clinical Medicine, Pathology, and Hygiene.

ALBERT N. BLODGETT, M.D., SECRETARY.

(*Concluded.*)

The enormous dilution of sewage in this country is mentioned as an objection. By analyses the amount of organic matter in the sewage of American and European cities varies but a trifle. Boston consumes more water per capita than Paris. But the latter city dilutes her sewage equal to that of our own by a lavish use of water in washing the streets each morning. And the estimate of three barrels of water to the discharge of one individual here does not include the organic matter constantly discharged from sink drains or the street washings. Durand-Claye, the celebrated French engineer, to whom the world owes a debt of gratitude for demonstrating the possibility of epuration by this method, says, "It is desirable and necessary that there should be a great dilution by water in order to insure rapid transit."[1]

The soil does not clog where systematic irrigation is practiced. The thin skin of impervious deposit, when dried, shrinks, cracks, and breaks up, the organic matter decays, and the soil is more pervious than where irrigation is not employed. Reservoirs of deposit are used to eliminate the coarse particles, as their decay on the surface would cause an offensive odor.

It is highly probable that the failure mentioned as resulting from an impervious deposit where "sewage was pumped on a garden," was due to puddling. And that it is an unnecessary accompaniment to irrigation is proved by the employment of this system at Buntzlau on fifteen hectares for over two and a half centuries, and at Edinburgh for over two centuries, without diminishing the permeability of the soil.

As to the impossibility of obtaining suitable soil of sufficient area in Massachusetts for the general employment of this system, the success which has attended the efforts of the English in finding it in their thickly populated island is an answer. Our forests could be utilized with little expense, and next to Italian rye grass the trees would prove the best absorbers of filth. A few acres of willows at Windsor take care of the sewage of twelve thousand people.

I recall but one other objection, the comparatively large rain-fall here, forty and fifty inches per year. At Gennevilliers 312 inches of water is sent on the land each year, and this "without making it damp or marshy since the establishment of subsoil drainage." And I know of two farms in my native town, in Worcester County, where irrigation with brook water has been practiced with advantage. Our average rain-fall is a little larger than that of Great Britain, where it is from forty to fifty inches per annum, but the yearly average humidity (between eighty and eighty-six) is nearer the point of saturation there than here, where it is about seventy. Dr. Frankland considers the vapor in the atmosphere of England as "reducing the temperature from fifteen to twenty-five degrees;" and Tyndall remarks that "the abundance of atmospheric vapor hinders the radiation of heat at night in England." The protracted droughts which are so common in this country are unknown in England, where vegetation never suffers from want of moisture. I am indebted to Dr. Bullard for facts and figures on this branch of the question, which enable me to say with positiveness that the meteorological conditions of our climate, with the possible exception of winter temperature, are far superior to those of England for the employment of irrigation and agriculture.

To-day I only ask that before building a metropolitan sewer for the eastern part of the State to discharge in tide-water, and thus repeat the now demonstrated errors of London, Brighton, and Torquay, irrigation and agriculture may be tried, on a limited scale, by some one having faith in the success, as we might ultimately desire to reverse the current of the sewage of the metropolitan district.

A large proportion of our rural population have gardens attached to their houses. I would discourage the use of cess-pools and recommend the use of these lands for the disposal of sink water. I am informed that Dr. Jewett, of Northborough, has for many years employed this system, and I have practiced it myself for ten years with complete satisfaction.[1]

Victor Hugo, in Les Miserables, describing the sewerage of Paris more than twenty years ago, makes a vivid picture of our systems at the present time. He writes as follows:—

"*The Earth Impoverished by the Sea.* Paris throws twenty-five millions a year into the sea. And this without metaphor. How, and in what manner? Day and night. With what object? Without any object. With what thought? Without thinking. For what return? For nothing. By means of what organ? By means of its intestine. What is its intestine? Its sewer. * * * Science, after long experiment,

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[1] Babut du Maris quotes Dr. Carpenter as saying "the more dilute the better."

[1] In view of the well-known results of chemical analyses of sewage the question as to its fertilizing properties seems to be out of place. It is almost the only fertilizer the Chinese employ. "The Duke of Portland used nothing but sewage on his farm at Mansfield, and obtained a net return of about $125 per acre." (Babut du Maris.)

now knows that the most fertilizing and the most effective of manures is that of man. The Chinese, we must say to our shame, knew it before us. No Chinese peasant, Eckeberg tells us, goes to the city without carrying back, at the two ends of his bamboo, two buckets full of what we call filth. Thanks to human fertilization, the earth in China is still as young as in in the days of Abraham. Chinese wheat yields a hundred and twenty fold. There is no guano comparable in fertility to the detritus of a capital. A great city is the most powerful of stercoraries. To employ the city to enrich the plains would be a sure success. If our gold is filth, on the other hand our filth is gold. What is done with this filth, gold? It is swept into the abyss. We fit our convoys of ships, at great expense, to gather up at the south pole the droppings of petrels and penguins, and the incalculable elements of wealth which we have under our own hands we send to the sea. All the human and animal manure which the world loses, restored to the land instead of being thrown into the water, would suffice to nourish the world.

"These heaps of garbage at the corners of the stone blocks, these tumbrils of mire jolting through the streets at night, these horrid scavengers' carts, these fetid streams of subterranean slime which the pavement hides from you, do you know what all this is? It is the flowering meadow, it is the green grass. It is marjoram and thyme and sage, it is game, it is cattle, it is the satisfied low of huge oxen at evening, it is perfumed hay, it is golden corn, it is bread on your table, it is warm blood in your veins, it is health, it is joy, it is life. * * *

"Statistics show that France alone makes a liquidation of a hundred million every year into the Atlantic Ocean from the mouths of her rivers. The cleverness of man is such that he prefers to throw this hundred million into the gutter. It is the very substance of the people which is carried away, here drop by drop, there in floods by the wretched vomiting of our sewers into the rivers, and the gigantic collection of our rivers into the ocean. Each hiccough of our cloaca costs us a thousand francs. From this follow two results: The land impoverished and the water infected. Hunger rising from the furrow, and disease arising from the river. * * *

"A system of elementary drainage, as simple as the lungs of a man, and which is already in full operation in several villages in England, would suffice to bring into our cities the pure water of the fields, and send back into our fields the rich water of the cities, and this easy see-saw, the simplest in the world, would retain in our possession the hundred million thrown away.

"The present system does harm in endeavoring to do good. The intention is laudable, the result deplorable."

On motion of Dr. Henry I. BOWDITCH, it was

*Voted*, "That the thanks of this Society be tendered to the scientific gentlemen, not members of our body, who have contributed so much to our instruction and to the great interest of these meetings."

Adjourned.

# DOMESTIC CORRESPONDENCE.

## THE RATIONAL TREATMENT OF ASIATIC CHOLERA.

BY J. R. UHLER, M.D., BALTIMORE, MARYLAND.

In an article upon Asiatic Cholera, printed in this journal Aug. 9, among other things, hypodermic injections of water, or artificial serum, into the areolar tissue, are suggested in quantity sufficient to supply the waste from the bowels. This I think useful treatment, but the method of applying it does not seem to be the best, since the quantity of fluid needed would, if used in a few places, distend the tissues under the skin to such an extent as to produce large cavities, abscesses, and much discomfort, and if only a small quantity were injected in each place so many punctures would be required as to render it highly objectionable to most patients. A better plan, it seems to me (which I employed to nourish a patient who could not swallow), would be to use two or four hypodermic syringes deprived of their pistons connected by soft rubber tubing, with a reservoir or reservoirs similar to the aspirator, without valves or with valves reversed, containing the fluid, and insert the needles in the lose areolar tissues of each of the extremities and let them remain. By this means the tissues will be continually bathed with the serum filling the tubes by natural flow, care being taken not to elevate the reservoirs too high, so as to produce much pressure, and the liquid could then be uninterruptedly absorbed from the four points.

Another plan which, from doing all the work at once, and from the situation where it is applied, seems preferable to a surgeon, is to inject, and gently fill, the *peritoneal cavity* (by the aspirator or other instruments) with sterilized, artificial serum at the temperature of the body, thus bringing the fluid in contact, like ascitic fluid, with the other side of the greedy intestines, where it will act by pressure, slightly diminishing the lumen of the bowels, and can be absorbed to prevent the tarry condition of the blood, and also by exosmosis dilute, and wash away when the bowels are moved, those low forms of life that are said by Koch to be the cause of the disease.

234 W. Fayette St.

## TÆNIA SAGINATI.

CHICAGO, August 11, 1884.

The youngest on record—not the worm, but the patient having it. It is not that tænia is a rare bird, or the catching of it a matter requiring much skill, yet because of the "early youth" of the patient I give you the facts. Ella May Sullivan, of Chicago, born December, 1881—consequently 2½ years old—latterly passed sections of the saginati. On Saturday was relieved of the "varmint." Who can give dates of a younger child passing tænia? Look up your records.

J. R. WILKINS, M.D.

## NECROLOGY.

GRIFFITHS, THOMAS JONES, M.D., Surgeon U. S. Marine Hospital Service (retired), was born in South Wales, Sept. 10, 1826: died at his residence in Louisville, Ky., June 1, 1884. He received his literary education in England, and at an early age came to this country and settled at Louisville, Ky., where he studied medicine and was graduated in the Kentucky School of Medicine in 1852. He commenced the practice of medicine in Louisville, and rapidly acquired prominence in the profession, the esteem of his confrères, professional success and prosperity. During the war between the States he was appointed by the government Surgeon in charge of the Park Barracks and several military hospitals in Louisville.

In 1869 he was appointed Surgeon in charge of the U. S. Marine Hospital at Louisville, and remained in this service until 1877, when he retired from active duty on account of ill health, but was made consulting surgeon to the hospital. As an officer of this service he was active, efficient, widely known, and universally popular with his patients.

He was a man of vigorous mental and physical powers, an acute observer, a careful student, and an untiring worker in the line of legitimate medicine, to which he had contributed many valuable papers. He was a member of the various local medical societies in Louisville, the Kentucky State Medical Society, and of the American Medical Association, since 1874.

On the announcement or his death a meeting of the physicians of Louisville was called in respect to his memory, and resolutions of sympathy and regret were passed, which were ordered published in the Louisville and Philadelphia medical journals, also the daily papers.

A large number of physicians of the city attended the funeral, the cortege being one of the largest seen in the city. The remains were interred in Cave Hill Cemetery.

His wife and an only son, Dr. Wm. M. Griffiths, survive him.

H. W. AUSTIN, M.D.

## MISCELLANEOUS.

### OFFICIAL NOTICE.

ANNUAL DUES from members of the Association—*Five Dollars* per annum—are payable directly to the Treasurer. Such payment entitles them to receive the JOURNAL of the Association for one year.

SUBSCRIPTIONS TO THE JOURNAL from those who are not members should be forwarded to the office of publication, Chicago.

BACK VOLUMES OF THE TRANSACTIONS may be procured, at reduced rates, by addressing the Treasurer.

THE INDEX to the 33 Volumes of Transactions will be forwarded, postpaid, on receipt of *One Dollar* by the Treasurer.

According to a resolution passed May 9, 1884, at the Washington meeting, continuous payment of Annual Dues is required, to retain permanent membership.

RICHARD J. DUNGLISON, M.D.,
*Treasurer.*
Lock Box 1274, Philadelphia, Pa.

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THE PLAGUE COMING THIS WAY.—Washington, Aug. 19.—The United States consul at Barbadoes, West Indies, telegraphes to the state department as follows: "The ship Bracadaile left St. Lucia for New York on the 16th with cholera. This is the British steamer which left Calcutta on the 4th of June bound for Demerara and New York. The cholera broke out during her passage, and on her arrival at Table bay, July 4, she was reported to have had eighteen fatal cases. There were 651 coolies on board, of whom twenty-eight were down with cholera. The steamer took in coal at Table bay and left for St. Lucia, where she arrived on the 3d inst., and was placed in quarantine." The health officer at New York has been notified to quarantine the vessel on her arrival.

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YELLOW FEVER.—The schooner "J. Taylor," from Porto Bello, arrived at Cape Charles quarantine station on the 12th inst., with three cases of supposed yellow fever on board. One death had occured on board previous to the arrival of the ship. The sick were removed to the U. S. Quarantine Station, Fisherman's Island, and the vessel permitted to proceed to the Baltimore quarantine.

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OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT UNITED STATES ARMY, FROM AUGUST 9, 1884, TO AUGUST 15, 1884.

Bartholf, J. C., Captain and Assistant Surgeon, relieved from duty at Vancouver Bks., Wash. T., and ordered to take station at Portland, Oregon. (Par. 1, S. O., 114 Hdqrs. D. of Col., August 1, 1884.)

Heymann, C. L., Captain and Assistant Surgeon, ordered to proceed to Fort Ontario, N. Y., and report for duty. (Par. 3, S. O., 163, Hdqrs. D. of East, August 3, 1884.)

Kane, John J., Captain and Assistant Surgeon, granted leave of absence for one month. (Par. 1, S. O., Hdqrs. D. of East, August 10, 1884.)

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LIST OF OFFICIAL CHANGES IN THE MEDICAL CORPS OF THE NAVY, FOR THE WEEK ENDING AUGUST 16, 1884.

Medical Inspector E. Bogert, to be Fleet Surgeon, Asiatic Squadron.

Surgeon H. I. Babin, detached from Minnesota, ordered to Marine Rendezvous, N. Y.

P. A. Surgeon R. Whitney, detached from Marine Rendezvous, N. Y., ordered to Naval Academy as member of Examninig Board.

Surgeon G. H. Cooke, ordered to Naval Academy as member of Examining Board.

P. A. Surgeon P. M. Rixey, detached from special duty at Washington, ordered to U. S. S. "Lancaster."

Surgeon T. Woolverton, ordered to U. S. S. "Minnesota."